



101046965 Saskatchewan Ltd.

Floral Road Industrial Subdivision  
Comprehensive Development Review 2022

02 November 2022

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### Revision Log

Revision #	Revised By	Date	Issue / Revision Description
1	FSL	27 Oct 2022	Preliminary Draft Report
2	FSL and PINTER	28 Oct 2022	Draft Report
3	FSL	31 Oct 2022	CDR Report for submission to RMCP
4	PINTER	02 Nov 2022	CDR Report for submission to RMCP

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## Executive Summary

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This Comprehensive Development Review is for a 5-lot Industrial subdivision 6 km southeast of Saskatoon, along Highway 16 at Township Road 360 (Floral Road) in the RM of Corman Park.

This document was created by summarizing previous reports, existing information, Client and RM of Corman Park project team involvement and input from local landowners. It describes the existing conditions, proposed development, required infrastructure, supporting document information, municipal policy compliance and public consultation concerns.

This proposed subdivision will create 4 new lots in addition to the 1 existing lot on the site. These lots will be used by light industrial business operations to serve the Saskatoon region.

Figures representing the physical geography, existing land use, infrastructure and future growth areas are included in Appendix A.

All further supporting reports and information can also be found in the Appendices.

Special thanks to our Client for their knowledge and insight regarding the development project, local businesses and their objectives for the future.



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## 1.0

## BACKGROUND

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### 1.1. INTRODUCTION

This document and supporting appendices are submitted along with the application to subdivide parcels located approximately 6 km southeast of Saskatoon along Highway 16 at Township Road 360 (Floral Road). The property size is 7.13 ha (17.62 ac), located within the RM of Corman Park (RMCP) East Floral Industrial Park.

Legal Description: Parcel C-Plan 102326431, Surface Parcel Number: 203772326, 1.213 ha (3 ac)

Legal Description: Parcel B-Plan 98MW20997 Surface Parcel Number: 203772337, 5.92 ha (14.63 ac)

Both parcels are located within NE-35-35-04-W3

The application is for subdivision only. Rezoning is not required.

The purpose of this application is to create a 5-lot Light Industrial (M1) subdivision. While it is still unknown what exact businesses will locate within the subdivision, they will be comparable to manufacturing, processing, assembly, repair, and end user production and distribution activities requiring minimal servicing and limited storage of raw inputs. New businesses will be of the uses described and characterized by Zoning Bylaw Schedule J and Official Community Planning (OCP) Section 6.3.4.

In general, the developer observes an opportunity to sell lots and establish businesses that will cater to the local and regional market. This subdivision will compliment surrounding businesses, existing infrastructure and the Saskatoon market region. One of the key advantages for this site is the short commute time to the Saskatoon urban area. Another being, that this site is currently zoned for industrial use and is within an operating industrial area.

The developer proposes to apply for a potential second subdivision after the RMCP has taken ownership of Agar Road 'south'. This Phase 2 subdivision would create an additional 3 lots out of proposed Lot K for a total of 8 final lots within this development site. The layout plan for Phase 1 and 2 are both shown on the Plan of Proposed



Subdivision (PPS) in Appendix E. The Phase 2 lots are taken into account for design estimates and are part of the existing Drainage Plan design.

There is currently one existing business on proposed Lot J.

## 1.2. STUDY PROCESS

The initial endeavour to subdivide this property began approximately 5 years ago. At that time the developers commenced technical reports and discussions with the RMCP. Since that time, the reports have all been completed and there is a sound rationale for the sale of lots to light industrial businesses. Beyond obtaining the required technical reports, the developer has had ongoing discussion with consultants, RMCP staff and local landowners.

This Comprehensive Development Review (CDR) provides the supporting documentation for consideration of a proposed Light Industrial subdivision in the RMCP. It is submitted in accordance with the procedural requirements of the Official Community Plan and the CDR Checklist. This document provides summaries and explanations of relevant technical reports found in the Appendices. In addition, this CDR outlines the design rationale and development objectives that will ensure this is a high-quality development for the RMCP and region.

The first section of this CDR summarizes the proposed development and draws conclusions from technical reports, consultations, and comments that are all included in full as appendices in the second section of the report. Appendices include the Plan of Proposed Subdivision and supporting technical reports for the site.

PINTER & Associates Ltd. was retained by the developer in order to provide engineering, planning, design and environmental assistance for this development project. This CDR has been prepared by Finch Services Ltd. under contract to PINTER and with ongoing consultation and involvement by PINTER along with continual input and direction from the developer. PPS and supporting information are provided by Webb Surveys. RMCP planning staff have been consulted periodically throughout the application process for clarification and further direction when needed (in particular to the drainage aspects).



**1.3. PROJECT TEAM**

**Table 1.1 - Project Team**

Titles	Staff
Developer/Applicant	101046965 Saskatchewan Ltd.
Project Manager: PINTER & Associates Ltd.	Dustin Hicke, A.Sc.T.
Project Engineer: PINTER & Associates Ltd.	Ibrahim El-Baroudy, Ph.D, P.Eng.
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Project Planner: Finch Services Ltd.	Andy Gehl, RPP, MCIP
RM of Corman Park Liaison	Adam Toth, RPP, MCIP



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## **2.0 PROPOSED DEVELOPMENT & LAND USE**

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### **2.1. LAND USE CONTEXT**

Refer to Figures 1,2,3, and 4 in Appendix A for satellite imagery and location context mapping.

Refer to ISC Surface Parcel Plans in Appendix B for reference information, dimensions and surrounding parcel numbers.

The combined size of existing Parcels B & C is 7.13 ha (17.62 ac). The entire site is zoned M1-Light Industrial District. No rezoning is required for this subdivision application.

The developer anticipates this to be a 2-Phase subdivision. The first phase would subdivide the entire site into 5 lots with 4 subdivided out of the approximate north half and one remaining lot being the approximate south half. Phase 2 will be the subdivision of the south lot (proposed Lot K) into 4 lots. After both phases, there would be a total of 8 lots on this site.

The Plan of Proposed Subdivision is included in Appendix E.

RMCP Zoning Bylaw minimum lot size is 0.8 ha (2 ac) and minimum frontage of 30 m. The proposed development has a minimum lot size of 0.81 ha (2.01 ac) and minimum frontage of 53.74 m in Phase 1 and 42.17 m for Phase 2.

There is currently one existing business on proposed Lot J with office spaces, reception area and parking.

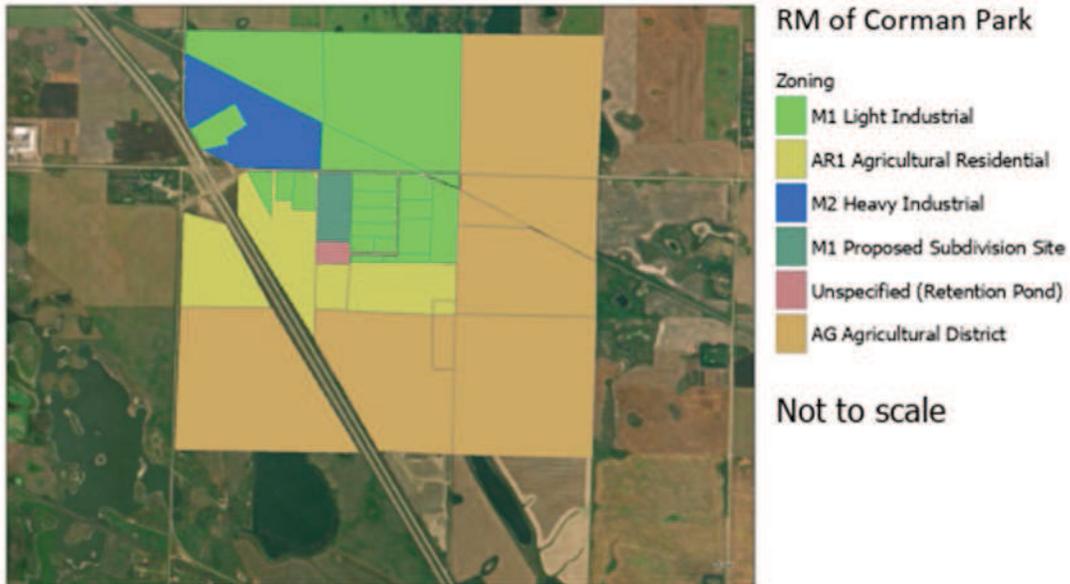
The proposed site is surrounded by multiple existing light industrial, industrial, agricultural and commercial type business operations.

Surrounding land uses are primarily also M1-Light Industrial with a portion of AR1-Agricultural Residential to the south west and MU1 stormwater retention pond directly south of the parcel.

Refer to Figure 1 created from the RMCP interactive Map.



Figure 1: Existing Land Use



This subdivision will complement East Floral Industrial Park very well. The proposed development will be used for the exact purpose and intent of this area as described in the OCP and current zoning policy. As well, the future uses will be compatible and similar to existing surrounding businesses as they too are approved under the same zoning and land use designation.

No public areas are proposed for this subdivision.

**2.2. HAZARD LANDS, NATURAL & HERITAGE RESOURCES**

An inquiry was made in February 2022 using the Heritage Conservation Branch Online Screening Tool. Both parcels within this quarter section are listed as ‘not heritage sensitive’.

Refer to Developers Online Screening Tool in Appendix F.

The completed Phase 1 ESA does not identify on-site or off-site contamination that could affect the overall condition of the property. All identified potential hazards are from the inherent releases that may take place if the existing building is ever renovated or demolished. It also states “no further environmental assessment work is recommended for the Subject Property”.

Refer to Phase 1 ESA in Appendix H.



Historical imagery dating back to 1975 confirms that prior to being a commercial/industrial use this site was fully cultivated agricultural production land.

An inquiry was made in February 2022 using the Hunting, Angling and Biodiversity Information (HABISask) online screening tool. The HABISask screening tool noted a circular area, with an approximate 4 km radius, within which there is the potential to contain the presence of northern blue-eyed grass. The proposed subdivision falls within a small portion of this area. As of January 2022, the northern blue-eyed grass is ranked as “S3” by the Saskatchewan Conservation Data Centre, meaning it is considered “vulnerable/rare to uncommon”. It is unlikely that there is potential for growth within this area due to the relatively high level of automobiles, equipment, storage construction, demolition and ongoing activity inherent to the current and past businesses. As well, prior to being a Light Industrial use, the site was completely cultivated for production farmland.

There are no significant sustainable development or environmental management practices intended for this subdivision. Future owners and businesses will be required to follow the development permit process, building permit process, and the National Building Code as well as the RMCP policies within the OCP, Zoning Bylaw, and any other applicable Municipal and Provincial regulations.



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## 3.0 OCP & ZONING BYLAW POLICY REVIEW

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### 3.1. OCP POLICY

*Section 4.2.3: When assessing Intensive Livestock Operations, Council shall consider the factors listed in Section 4.2.7 and whether the following recommended separation distances from the uses listed in Table 1.*

This subdivision does not include any use for Intensive Livestock Operations (ILO). There are no ILOs within the proximity to Industrial Parks listed in Table 1. I.e., there is no ILO within a 1.6 km radius.

*Section 6.1.1: To maximize the economic benefits of industrial development activities, while at the same time minimizing land use conflicts and environmental concerns associated with such development.*

This subdivision will create 5 M1 lots on the same amount of land where there is currently 2. (After the Phase 2 subdivision, there will be a total of 8 lots where there is currently 2). The industrial use of the site and the area as a whole will be increased due to this development and will garner the maximum amount of benefit from this property.

There will be minimal land use conflicts as the adjacent parcels are already subdivided and being used for industrial purposes. The parcels north and south of this site are currently used for agriculture with no residences nearby. If at some point in the future there are residential or commercial uses that are developed nearby, this industrial park will still have physical and geographic buffers of established industrial operations, Highway 16, stormwater retention ponds and rail lines.

There are no identified environmental concerns for this site. Any future environmental impact will be due to the ongoing operation of future businesses that will be regulated by The Environmental Management and Protection Act, The Dangerous Goods Transportation Act, The Fire Safety Act, The Fire Safety Regulations, and the National Building Code.

*Section 6.1.3: To provide for high quality rural industrial development through appropriate subdivision design and location criteria.*



The proposed subdivision is a very efficient design of rectangular lots using access to existing roads. Lot sizes are sufficient for the types of business allowed within M1 zoning and market analysis done by the developer. This subdivision will expand lot inventory within an existing industrial park that is near major transportation routes. It has close proximity to Saskatoon for employment and market servicing and has few, if any, conflicts with nearby land ownership.

*Section 6.2.1: In order to evaluate industrial development proposals, a Comprehensive Development Review (CDR) shall be completed prior to consideration of an application to rezone or subdivide land for industrial use. The CDR shall address all matters of land use integration, environmental sustainability, public involvement and potential conflict mitigation, and the provision of services to the development as set out in the Zoning Bylaw.*

This CDR report responds to the requirements of the OCP and ZB regarding land use, environment, public consultations, mitigation, services, and supplies supporting information.

*Section 6.2.2: Industrial development should be located on sites that:*

*a) permit the economically-feasible provision of public services including but not limited to roadways, power, telecommunication, rail lines, police and fire protection;*

The site for proposed subdivision has immediate access from Floral Road to the north and Agar Road to the west. Road approaches will be designed in accordance with the RMCP design standards and submitted for approval.

SaskPower has provided a confirmation letter stating electrical service is available for this subdivision. See Appendix K.

SaskTel has provided a confirmation letter stating basic phone service and fibre optic cable is available for this subdivision. See Appendix M.

While there is a rail line approximately 300 m north of this subdivision, there is no need or desire to connect to this line. This subdivision is not a 'rail serviced' development.

Police and fire protection services will be provided through the RMCP services and subsequent agreement with City of Saskatoon services.



*b) are in close proximity to, or adjacent to, an appropriately engineered road way and/or rail access;*

The proposed development site is located immediately adjacent to Floral Road to the north. This is a permanent municipal haul road intended for large heavy vehicles and material transport.

Agar Road is immediately adjacent to the west and provides access for the remaining lots. This is a paved access road used by other local operations and connects to South Floral Siding Road.

*c) are not prime agricultural land;*

This site is zoned M1-Light Industrial. It has been used for agricultural production in the past, but now has buildings, parking and other business materials on the site. The parcel is restricted in all directions by existing development and infrastructure. Agricultural operation on this parcel would be a conflicting and inefficient land use.

*d) do not have high quality aggregate resources, unless the purpose of development is to extract the aggregate resources;*

No high-quality aggregate is identified for this site. The Geotechnical Investigation stratigraphy analysis describes silt to 3 m with silt and clay to 7.5 m. There is a very stiff and silty till that extended to the maximum depth of investigation. Only BH4 shows a minor indication of occasional gravel beyond 4 m.

See Geotechnical Investigation in Appendix G.

*e) are not prone to natural hazards and/or flooding;*

This site has an overall natural drainage flow to the southwest. It is not prone to natural flooding as there are engineered drainage management systems in the area that control local drainage and runoff. This site has its own engineered drainage plan to control and manage the risk of flooding. See the Drainage Plan in Appendix I and the Topographic Survey in Appendix C.



The environmental report shows no identification of pits, wells or watercourses on this site. The parcel is relatively level and does not show occurrences for slumping or high erosion. See the Phase 1 ESA in Appendix H and the Topographic Survey in Appendix C.

*f) do not have unique historical or archaeological significance;*

The Land Sensitivity Search identifies this site as being ‘not heritage sensitive’ and that it is not necessary to submit to Heritage Conservation Branch for screening.

See Developers’ Online Screening Tool in Appendix F.

The site has been used for tilled agricultural operations for many years. See photo logs within the Phase 1 ESA in Appendix H.

*g) do not have significant wildlife habitat*

An inquiry was made in February 2022 using the Hunting, Angling and Biodiversity Information (HABISask) online screening tool. The HABISask screening tool noted a circular area, with an approximate 4 km radius, within which there is the potential to contain the presence of northern blue-eyed grass. The proposed subdivision falls within a small portion of this area. As of January 2022, the northern blue-eyed grass is ranked as “S3” by the Saskatchewan Conservation Data Centre, meaning it is considered “vulnerable/rare to uncommon”. It is unlikely that there is potential for growth within this area due to the relatively high level of automobiles, equipment, storage construction, demolition and ongoing activity inherent to the current and past businesses. As well, prior to being a Light Industrial use, the site was completely cultivated for production farmland.

*h) are not high quality recreational land;*

This site does not have recreational potential. It has been used for agricultural production for many years, has no access to natural recreational features (lake, river, hiking, etc.), and is completely surrounded by industrial uses and supporting municipal infrastructure.



*i) will not pollute or otherwise adversely impact groundwater and/or surface water resources;*

Creating new lots through this subdivision and the construction of new infrastructure and utilities will not inherently impact or pollute groundwater or surface water. Future businesses to be developed will be required to follow the development and building permit process and operate under the relevant policies and restrictions i.e. Environmental Management and Protection Act, National Building Code, etc.

Each new lot will be using an independent sanitary waste management system for its buildings and operations.

*j) have suitable drainage;*

The site is relatively flat. Natural drainage from the northeast area flows to the north drainage ditch along Township Road 360 and west into the ditch east of Agar Road. The remainder of the site generally drains west into the ditch east of Agar Road. This ditch flows south to the municipal storage lagoon.

The post-development drainage plan is to grade each lot with a minimum slope of 0.5-1.0% toward one of the two on-site ponds. The first, West Municipal Pond MU1, is a linear pond located along the west boundary of proposed Lot F at the northwest corner. MU1 will have a maximum storage capacity of 234 m<sup>3</sup>. The second, Municipal Pond MU2, is a linear pond located along the south boundary of Lot K. MU2 will have a maximum storage capacity of 289 m<sup>3</sup>.

To accommodate the lot drainage flows, a 15 m easement will be applied along the north and west edges of the site.

See the Drainage Plan in Appendix I.

*k) do not lead to land use conflicts with adjacent lands*

There are no expected land use conflicts as the adjacent parcels are already subdivided and being used for industrial purposes. The parcels north and south of this site are currently used for agriculture and water retention with no residences nearby. If at some point in the future there are residential or commercial uses that are developed nearby, this industrial park will still have physical and geographic buffers of the established industrial operations, Highway 16, stormwater retention ponds and rail lines.



*Section 6.2.5: Industrial development shall comply with the required separation distances as provided in Section 4.2.3, Table 1.*

This subdivision does not include any use for ILO. There is no ILO within the proximity to Industrial Parks listed in Table 1. I.e. there is no ILO with a 1.6 km radius.

*Section 6.2.6: Industrial developments shall meet all municipal and provincial regulations respecting access to and from provincial highways, arterial roadways, and other public roads.*

This subdivision layout has no direct access to a provincial highway or an arterial road. Individual lot access is from municipal roads and the road approaches will follow the RMCP design standards. These proposed new lots are outside the 427 m control circle defined by MHI for a potential new interchange at the intersection of Highway 16 and Floral Road.

*Section 6.2.7: All industrial developments must assess and avoid or mitigate potential impact on natural and heritage resources.*

The Land Sensitivity Search for this site identifies it as ‘not heritage sensitive’ and it is not necessary to submit to Heritage Conservation Branch for screening. See the Developers’ Online Screening Tool confirmation in Appendix F.

The site has been used for tilled agricultural operations for many years. See photo logs within the Phase 1 ESA in Appendix H.

*Section 6.2.8: Industrial developments shall be designed and constructed to ensure that alteration to drainage, landscape, or other natural conditions occurs in a way that avoids or mitigates on and off site impacts and that respects any inter-municipal agreements on the extension of urban infrastructure to the area.*

Lots F, G, and H will be graded with an approximate slope of 0.5 - 1.0% to the north. Then the flow will drain west along a 15 m easement to holding pond MU1 at the northwest corner of the site.

The Lot K (and proposed Phase 2 lots L, M, N, P) will be graded with an approximate slope of 0.5 - 1.0% to the west. Then the flow will drain south along a 15 m easement to holding pond MU2 along the south boundary of Lot K (proposed future Lot P).



The natural landscape and conditions have been already altered by years of agricultural production and business operations. Landscaping plans will be provided at a later time prior to development and/or building permit in compliance with the Zoning Bylaw.

*Section 6.2.9: The applicant shall be responsible for the construction of all infrastructure and services associated with the industrial development.*

*& Section 6.2.10: Industrial developments shall, when deemed necessary by the Municipality, enter into servicing agreements, when subdivision is involved, including any considerations the Municipality deems necessary in accordance with The Planning and Development Act, 2007.*

The applicant is an experienced developer and understands the infrastructure and services that are required for this subdivision. A servicing agreement between the RMCP and developer will be created at a later time and will outline the expected costs of servicing. Quotes from utility providers will be requested once subdivision approval is complete. This same developer has previously entered into a Service Agreement with the RMCP in 2019 for this same site as part of a previous subdivision application. They are familiar, experienced, and knowledgeable regarding the required process.

*6.3.1. The plan contains three classifications of industrial land use comprised of Business, Light Industrial and Heavy Industrial. These land use classifications define the three levels of intensity for industrial land use and are distinguishable by their propensity for creating offsite impacts, the need for traffic exposure, and dependency upon the use of land for the outdoor storage of raw and unfinished goods. Specific Zoning Districts under these land use classifications will be provided in the Zoning Bylaw.*

This site is currently zoned M1-Light Industrial.

*6.3.4. Light Industrial Classification is characterized as:*

*a) accommodating developments which have low to moderate potential for offsite impacts and/or land use conflicts with regard to noise, vibration, dust, smoke, aesthetics or odour and are less dependent on exposure to high traffic areas;*



This site is surrounded by other established industrial businesses, lots zoned for heavy industrial, agricultural, and water retention ponds.

*c) permitting limited outdoor storage of raw materials subject to screening to the satisfaction of the Municipality and an overall quality of site development that is superior to heavy industrial areas;*

Further individual business information can be provided after subdivision and at the development permit stage for each individual lot.

*6.4.1. Rural Industrial Parks shall not be located within:*

*a) 1 km (0.6 mile) of multi-parcel country residential or recreational development measured from the property boundary of the closest developable parcel located within the multi parcel country residential development or recreational development to the property boundary of the closest developable parcel within the Rural Industrial Park;*

There are no Multi-Parcel County Residential (MPCR) or recreational development boundaries within 1 km of this subdivision.

*b) within the separation distances outlined in Section 4.2.3. of an intensive livestock operation.*

This subdivision does not include any use for ILO. There is no ILO within the proximity to Industrial Parks listed in Table 1. I.e. there is no ILO with a 1.6 km radius.

*6.4.2. The planning of industrial development within established or proposed industrial parks shall ensure that industries with a high potential for land use conflicts are located in a manner that provides for adequate buffering from non-industrial uses of land through the use of distance separation and/or landscaping, providing a visual buffer from potentially impacted properties.*

Current land use to east and west of this site is currently also zoned for industrial purposes. Agricultural land to the north and south are buffered from a municipal road and water retention ponds, respectively. No land use conflicts are expected and there are existing physical geographic buffers in place.



*6.4.3. As a condition of approval of a multi-parcel industrial park subdivision, Council may in accordance with a septic monitoring bylaw adopted pursuant to The Municipalities Act, require the developer to incorporate a Community Association to monitor the ongoing operation and maintenance of an on-site wastewater system.*

At this time, the intent is to have independent wastewater storage systems constructed and managed by each individual business operation to purchase a lot. A waste removal provider has confirmed their capacity to service this development when needed by future business operations.

*11.1.1. To provide an effective and efficient road network throughout the Municipality to facilitate traffic flow generated by the variety of land uses.*

This proposed layout design does not include any internal road network. Each individual lot will have independent access to existing municipal road systems. Phase 2 will require access to the Agar Road 'south' when available through the RMCP. Traffic will easily connect with nearby Highway 16 and the well-established rural road network.

*11.1.2. To minimize the financial burden on the residents of the Municipality, resulting from developments in the Municipality.*

Construction costs for subdivision servicing will be borne by the developer. Individual businesses will construct their own individual business infrastructure required for operations. A servicing agreement between the applicant and the RMCP will occur at the appropriate time prior to development. Further utility cost quotations are not available at this time and are expected to be supplied post-subdivision approval by the relevant provider.

*11.1.4. To ensure services are provided in an economic and efficient manner.*

This subdivision is located with an area already being serviced and used for industrial purposes. The required infrastructure is already in the area and minimal expansion is needed to extend to these new internal lots. This is likely the most economic and efficient manner to increase the inventory of new business.



*11.2.1. All new development proposals in close proximity to any road in the Municipality shall allow for expansion of those roads to standards designated by Council.*

Individual access will be provided to the existing right-of-way for the municipal roads. Construction on the proposed lots will be bound by the Zoning Bylaw setback restrictions and paving requirement.

*11.2.2. Any person proposing a subdivision and/or development of land shall, as a condition of approval, construct at his or her own expense and to standards established by the Council such roads as may be required by the subdivision and/or development.*

This proposed layout design does not include any internal road network. Each individual lot will have independent access to existing municipal road systems. Phase 2 will require access to the Agar Road 'south' when available through the RMCP. The individual road approaches will be constructed to RMCP design standards and approved as required.



### 3.2. ZONING BYLAW POLICY

*7.1. No building, structure or planting, or any other visual obstruction shall be constructed, erected, or placed within the area defined by the clear sight triangle as identified in Figure 4.*

Lot F is the only proposed lot to be impacted by the clear sight triangle. Lot F is sufficiently sized to accommodate this restriction along with the setback requirements of Schedule J Section 4.1 and allow a sufficient area for building footprint.

*12.9. Where a proposed development alters site drainage potentially affecting adjacent or downstream properties, the applicant shall be required to submit an engineered design for the proposed drainage works incorporating sufficient capacity to accommodate surface water runoff for a 1:100 year storm event with no incremental increase in offsite flows in excess of what would have been generated from the property prior to the new development.*

*& 12.10. Drainage works shall be constructed at the owner's expense to provide for adequate surface water drainage that does not adversely affect adjacent properties, or the stability of the land.*

A Drainage Plan report has been created by PINTER & Associates Ltd. which outlines the design for proposed drainage works to accommodate a 1:100 year storm event. The Drainage Plan shows the direction and percent grade proposed for surface runoff flow. Each lot has a drainage feature that direct runoff into one of the on-site retention ponds.

Proposed MU1 is a linear pond located along the west boundary of Lot F. It has capacity of 234 m<sup>3</sup>. MU1 utilizes an overflow culvert at the southwest corner of the pond to allow overflow into the existing drainage ditch along Agar Road.

Proposed MU2 is a linear pond located along the south boundary of Lot K (potential Phase 2-Lot P). It has a capacity of 289 m<sup>3</sup>. MU2 utilizes an overflow culvert at the southwest corner to allow overflow into the existing drainage ditch along Agar Road.

The final Drainage Plan was created with consultations by RMCP staff that have overall knowledge regarding the drainage systems for the surrounding area and the history of stormwater retention ponds to the south of this subdivision. This Drainage Plan has been acknowledged as being sufficient to accommodate the development of the proposed 8 lots by the Water Security Agency.



Refer to the Drainage Plan in more detail in Appendix I and WSA correspondence in Appendix Q.

*12.17. The use of landscaping is required adjacent to exterior storage areas within industrial developments to provide a natural screening of activities that are visible from public roads.*

Landscaping Plans would be submitted by individual lot owners during development permit process. These future submissions will describe solutions to various requirements regarding: landscaping plan, storage, screening, and lighting.

*15.4. A development permit shall not be issued for a non-agricultural use unless the site intended to be used, or upon which a building or structure is to be erected, abuts, or has frontage on a graded all-weather municipal roadway or provincial highway.*

All proposed lots within this subdivision have direct frontage and access to existing Township Road 360 to the north or Agar Road to the west.

*15.6. All site access from municipal roadways shall be to the satisfaction of the Director of Operations with respect to location, design, and construction standards. The Director of Public Works shall take into account safety and the physical capability of roads that are proposed to serve the development.*

*& 15.7. All approaches to municipal roadways require the approval of the Director of Public Works.*

*& 15.10. All approaches shall be constructed in accordance with the engineering standards of the Municipality or as authorized by the Director of Public Works.*

*& 15.11. Where an approach for a commercial, industrial, or residential lot within a multi lot subdivision requires access onto a paved road or highway, the approach shall be paved from the edge of the road surface to 5 m (15 ft) into the lot.*

This subdivision layout design does not include any internal roads or a service road. Each lot will have an independent road approach for access. The construction design of road approaches and application form will be provided to the RMCP for review and approval prior to construction.



*15.12. No development or use of land shall be permitted where the proposal will adversely affect domestic or municipal water supplies, or where a suitable, potable water supply cannot be furnished to the requirements of the Saskatchewan Health Authority and or Sask Water.*

The developer has received a confirmation email from SaskWater regarding a 7-lot subdivision on this site. At the time, the confirmation of water supply was manageable by the existing infrastructure in the area, and the distribution downstream of point of delivery is the responsibility of the developer. As previously requested, once the application is submitted, the developer will submit a Request for Service form for conditional approval until a Water Supply Agreement is drafted.

See prior SaskWater confirmation correspondence in Appendix L.

#### *SCHEDULE J - M 1 - LIGHT INDUSTRIAL DISTRICT*

##### *3.1. THE AREA REQUIREMENTS FOR PERMITTED AND DISCRETIONARY USES SHALL BE:*

*a) The minimum site area shall be 0.8 ha (2 acres).*

The smallest proposed lot has an area of 0.81 ha (2.01 ac)

See lot layout and dimensions within the Plan of Proposed Subdivision in Appendix E.

*b) The minimum lot frontage shall be 30 metres (98.4 ft).*

The smallest proposed lot frontage is 53.74 m in Phase 1 and 42.17 m in Phase 2.

See lot layout and dimensions within the Plan of Proposed Subdivision in Appendix E.



*4.1 SETBACKS:*

*a) Front yards: All buildings shall be set back a minimum of 45 metres (147.6 ft) from the centerline of a municipal road allowance or provincial highway or such greater distance as required by the Saskatchewan Ministry of Highways and Infrastructure, excepting sites which front on an internal subdivision road which shall be setback a minimum of 20 metres (65.6 ft) from the front site line.*

*& b) Side yards: All buildings shall be set back a minimum of 8 metres (26.2 ft) from the side property line. Where a side yard abuts a municipal road allowance or provincial highway, the front yard requirements shall apply.*

*& c) Rear yards: All buildings shall be set back a minimum of 8 metres (26.2 ft) from the rear property line, excepting properties where the rear site line is adjacent to a municipal road in which case all buildings shall be setback a minimum of 45 metres (147.6 ft) from the center line of the road allowance.*

All the proposed subdivision lots can accommodate the setback requirements while allowing sufficient buildable space for future business operation building placement.

See lot layout and dimensions within the Plan of Proposed Subdivision in Appendix E.



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**4.0****SERVICING**

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**4.1. ROADWAYS & TRANSPORTATION**

Regional access to the site is by Highway 16 which is 660 m west. Local access is along Township Road 360 (Floral Road). This is a well-travelled paved road. It is the same road used by all other businesses in the East Floral Industrial Park. Access to Phase 2 lots is from Agar Road. This is also an established and well-used paved road.

At the full build-out of Phase 2, there will a total of 8 lots on this site. This is not anticipated to greatly influence the traffic flows along Township Road 360 or Highway 16 as they are both currently well-used by local businesses with higher traffic generating characteristics and are well-maintained.

This subdivision layout plan has no internal road network and no proposed internal service road. There is 0 m of new roadway required to be constructed for this subdivision. It is understood that the developer will be required to cost share road improvements for the adjacent roads and that the amount required will be determined within a Service Agreement with the RMCP.

The main component for access and transportation is the construction of 8 new road approaches. The approaches will be paved surface to 5 m into the lot in accordance with Zoning Bylaw requirements. Application for approaches will be made to the RMCP for review and approval by the Director of Public Works. Approaches will include culverts to accommodate the existing and proposed drainage system for the site.

It is expected that the subdivision application will be referred to the Ministry of Highways and Infrastructure for their review.

Road approach locations can be found within the Drainage Plan in Appendix I.

**4.2. DRAINAGE**

The site is relatively flat. Natural drainage from the northeast area flows to the north drainage ditch along Township Road 360 and west into the ditch east of Agar Road. The remainder of the site generally drains west into the ditch east of Agar Road. This ditch flows south to the municipal storage lagoon.



The post-development drainage plan is to grade each lot with a minimum slope of 0.5-1.0% toward one of two on-site ponds. The first, Municipal Pond MU1, is a linear pond located along the west boundary of proposed Lot F. MU1 will have a maximum storage capacity of 234 m<sup>3</sup>. The second, Municipal Pond MU2, is a linear pond located along the south boundary of Lot K. MU2 will have a maximum storage capacity of 289 m<sup>3</sup>.

To accommodate the lot drainage flows, a 15 m easement will be applied along the north and west edges of the site.

See the Drainage Plan in Appendix I.

#### **4.3. WASTEWATER**

Each lot owner will be responsible for their own wastewater management. It is anticipated that the businesses to local here will be using holding tanks for independent use. Design plans for each lot will be provided for approval by the lot owner as part of their development permit and building permit applications. Local systems are required to follow the RMCP regulations and the Saskatchewan Onsite Wastewater Disposal Guide.

A Confirmation Letter has been provided by GFL stating that they can provide septic waste removal services for the proposed subdivision. Refer to letter in Appendix N.

#### **4.4. POTABLE WATER SUPPLY**

Potable water can be supplied through SaskWater with a Point of Delivery at the property line curb-stop. All further distribution lines would be the responsibility of the developer and lot owner. SaskWater anticipated an increase to 3.5 igpm and an estimated 84 cubic metres per month as development occurs. Note that this confirmation was originally for a 7-lot subdivision, so while estimates are approximate, they would be sufficient for Phase 1 and adjusted slightly higher to accommodate full Phase 2. The developer will continue to follow the process for approval by submitting a Request for Service form to obtain conditional capacity approval until a Water Supply Agreement has been drafted.



The amount of on-site storage is unknown at this time for each individual business operation. Individual lot water distribution design will take place along with the site development of each lot. Repairs and maintenance will be the responsibility of each individual owner.

The Confirmation Email from SaskWater can be reviewed in Appendix L.

#### **4.5. GEOTECHNICAL**

A Geotechnical Investigation Report was completed in March 2022. The report outlines the results of the investigation to characterize soil and groundwater conditions in relation to foundations for structures and roads. Borehole study provides information on groundwater conditions. Soil testing was used to aid in the interpretation of soil conditions and properties.

In general, the site stratigraphy consisted of 0 to 3 m of clayey silt overlying a distinct deposit of silt and clay that extended to a depth between 4.5 and 7.5 m. Following these layers was a very stiff, sandy, and silty till that extended to the maximum depth of investigation in all boreholes.

The report describes the construction considerations and recommendations for: shallow foundations, deep foundation, helical screw piles, site preparation, road and parking areas. Based on the soil types and ground conditions encountered, Cast-In-Place concrete piles are the recommended technique for this location.

Geotechnical Investigation Report can be reviewed in Appendix G.

#### **4.6. SHALLOW UTILITIES**

##### **4.6.1. SaskEnergy**

SaskEnergy has provided a conceptual design estimate of cost to service 3 lots on the site. They have estimated an average maximum load of 40.8 m<sup>3</sup>/hr at 1.75 kPa. The developer has been provided an estimated cost per lot for their construction expenses. SaskEnergy will proceed with final design when the developer's site plan and building sites are finalized. At that time, they will provide a final route selection and customer offer.

SaskEnergy Confirmation Letter can be reviewed in Appendix J.



**4.6.2. SaskTel**

SaskTel has confirmed that they have copper cable for basic phone service and fiber optic cable for large data services in the area. Further communication regarding supply design will take place after subdivision approval by RMCP.

SaskTel Confirmation Letter can be reviewed in Appendix M.

**4.6.3. SaskPower**

SaskPower has provided a Confirmation Letter that electrical service is available to provide power to the subdivision. They are able to provide a written quote with terms and conditions after subdivision approval is received from the RMCP.

SaskPower Confirmation Letter can be reviewed in Appendix K.

**4.7. SOLID WASTE**

GFL Environmental has supplied a Confirmation Letter stating they can provide garbage, recycling and septic waste removal services for the subdivision.

GFL Confirmation Letter can be reviewed in Appendix N.

**4.8. PROTECTIVE SERVICES**

Fire protection will be provided by the City of Saskatoon Fire Department based on the existing agreement in place with the RMCP. Individual lot owners and businesses will be responsible to supply adequate fire protection/suppression systems for their operations to satisfy as a minimum the National Building Code.

Police protective service will be provided by the RM Corman Park Police service and Saskatoon RCMP detachment.



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**5.0****PUBLIC CONSULTATION**

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**5.1. FORMAT & CONSULTATION PROCESS**

A mailout package was sent to 28 nearby landowners the week of July 11<sup>th</sup>.

The nearby landowners within 1.6 km are primarily agricultural producers or industrial business operations. As most owners are either in business nearby the site or do not have a day-to-day presence in the area, the mail-out format was selected as being most appropriate to reach the public for comments.

The package includes: letter of introduction and explanation by the developer, a summary of the proposed development, a comment form to be returned, location context images, Plan of Proposed Subdivision and on-site water retention cross-section.

All responses were received as completed Public Consultation Comment Forms. A total of four responses have been received.

The mail-out package can be reviewed in Appendix O.

The public responses can be reviewed in Appendix P.

**5.2. COMMENTS, RESPONSES & ACTIONS TAKEN**

**Comment 1:** landowner is in full support of the development.

No response or action taken by developer at this time.

**Comment 2:** landowner has no concerns to the subdivision application.

No response or action taken by developer at this time.

**Comment 3:** landowner (University of Saskatchewan) has had prior challenges due to the reduction of Bison grazing area due to what they believe is an expansion of existing wetlands due to uncontrolled runoff from previous development activities in the area. They request a drainage design that exceeds the 1:100 year event requirement and to be provided with a copy of the drainage plan for their review.



Action Taken: the developer has sent a copy of the updated Drainage Plan for their review and is available for further discussion if needed. If further comments are returned, they can be taken into account.

However, the Drainage Plan follows the requirement for a 1:100 year event and was created through ongoing consultation with RMCP staff as part of a larger runoff and retention issue that has been affecting the area for many years. It is not likely that utility construction above and beyond what is required for this site will have a positive impact on their specific issue or that is now this developer's sole responsibility to ameliorate an impact potential caused by previous developments. The U of S contact should be part of future discussions between RMCP, WSA, and landowners regarding regional drainage solutions.

**Comment 4:** Landowner raised questions regarding the pond design and location regarding winter traffic safety. They are concerned about depreciating land values in the area due to the presence of weeds and the view of the lots. They question why the existing drainage management system is not also being used for new development.

Regarding the design and management of the ponds: the ponds will be designed to reflect the findings of the Drainage Plan. There will now be two detention ponds instead of the originally proposed 8 smaller detention ponds. The ponds are within the development site as Municipal Utilities and are fed along registered easements. WSA has provided their comments of support regarding the drainage plan design.

Regarding location and winter road safety: the comment is a bit unclear, however, an assumption is made that the respondent is referring to the possibility that vehicles could leave the road and contact the ponds. The ponds are located outside the road right-of-way. There are now 2 pond locations as opposed to the originally designed 8. Both ponds are located behind a property fence and any required screening. It is also noted that the ponds proposed for this subdivision are similarly located yet more confined and protected than the ponds currently existing within the East Floral Industrial Park.



Regarding depreciation due to weeds and the view of lots: it is unclear why the presence of weeds is a concern for the loss of property value. Periodically throughout the year weeds and plant growth is common to this site, the entire East Floral Industrial Park and the surrounding rural area. As this is an existing Light Industrial zoned property surrounded by Heavy Industrial and agriculturally zoned property, it is unlikely that the visual presence of the proposed lots within the existing site will cause any harm to adjacent businesses. Quite likely any perceived negative impact will be to the contrary.

Regarding use of existing water management system: It is understood that there is insufficient capacity available in the nearby existing water retention ponds. Multiple discussions and meetings took place between the developer, PINTER engineers and the RMCP staff and WSA to determine a favorable design for surface runoff management.

Action Taken: The main concerns are non-specific and speculative. Comments have either been addressed by the drainage design for the site or are out of the developer's control.

The Drainage Plan can be reviewed in Appendix I.

WSA comments on the Drainage Plan can be reviewed in Appendix Q.



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**6.0**

**MAP CHECKLIST**

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Context map/figures are included in Appendix A, B, C, D

Plan of Proposed Subdivision is included in Appendix E

Pre-Development topographic contours figure is included in Appendix C

Post-Development Drainage Plans are included within the Drainage Report in Appendix I

Utilities Plan for extension of SaskEnergy supply is included in Appendix J

(Other utilities layout plans have not yet been requested or received by the service providers)

No Landscape Plan for public land is provided as there are no public lands proposed within the site.



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**7.0****TECHNICAL REPORTS & AGENCY  
RESPONSES**

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Geotechnical Investigation is available in Appendix G.

Rare plant survey and wildlife habitat inventory:

An inquiry was made in February 2022 using the Hunting, Angling and Biodiversity Information (HABISask) online screening tool. The HABISask screening tool noted a circular area, with an approximate 4 km radius, within which there is the potential to contain the presence of northern blue-eyed grass. The proposed subdivision falls within a small portion of this area. As of January 2022, the northern blue-eyed grass is ranked as “S3” by the Saskatchewan Conservation Data Centre, meaning it is considered “vulnerable/rare to uncommon”. It is unlikely that there is potential for growth within this area due to the relatively high level of automobiles, equipment, storage construction, demolition and ongoing activity inherent to the current and past businesses. As well, prior to being a Light Industrial use, the site was completely cultivated for production farmland.

Heritage Sensitivity Search: the confirmation that this quarter-section is not heritage sensitive can be found in Appendix F.

Engineered Drainage Report is available in Appendix I.

Ground and surface water evaluation: a Hydrogeotechnical Investigation has not been requested at this time. However, supporting information regarding groundwater can be found in the Environmental Phase 1 Report on page 10 in Appendix H, topographic contours are available in Appendix C and the Drainage Plan for the proposed subdivision is available in Appendix I.

Traffic impact analysis: has not been requested at this time. It is expected MHI will provide review comments as part of the CDR approval process.

Proposed wastewater treatment system: No treatment system is proposed for this subdivision. Each lot will be using independent holding tanks. Confirmation of septic waste removal service is available in Appendix N.



SaskEnergy confirmation is available in Appendix J.

SaskPower confirmation is available in Appendix K.

SaskTel confirmation is available in Appendix M.

Phase 1 Environmental Impact Assessment is available in Appendix H.

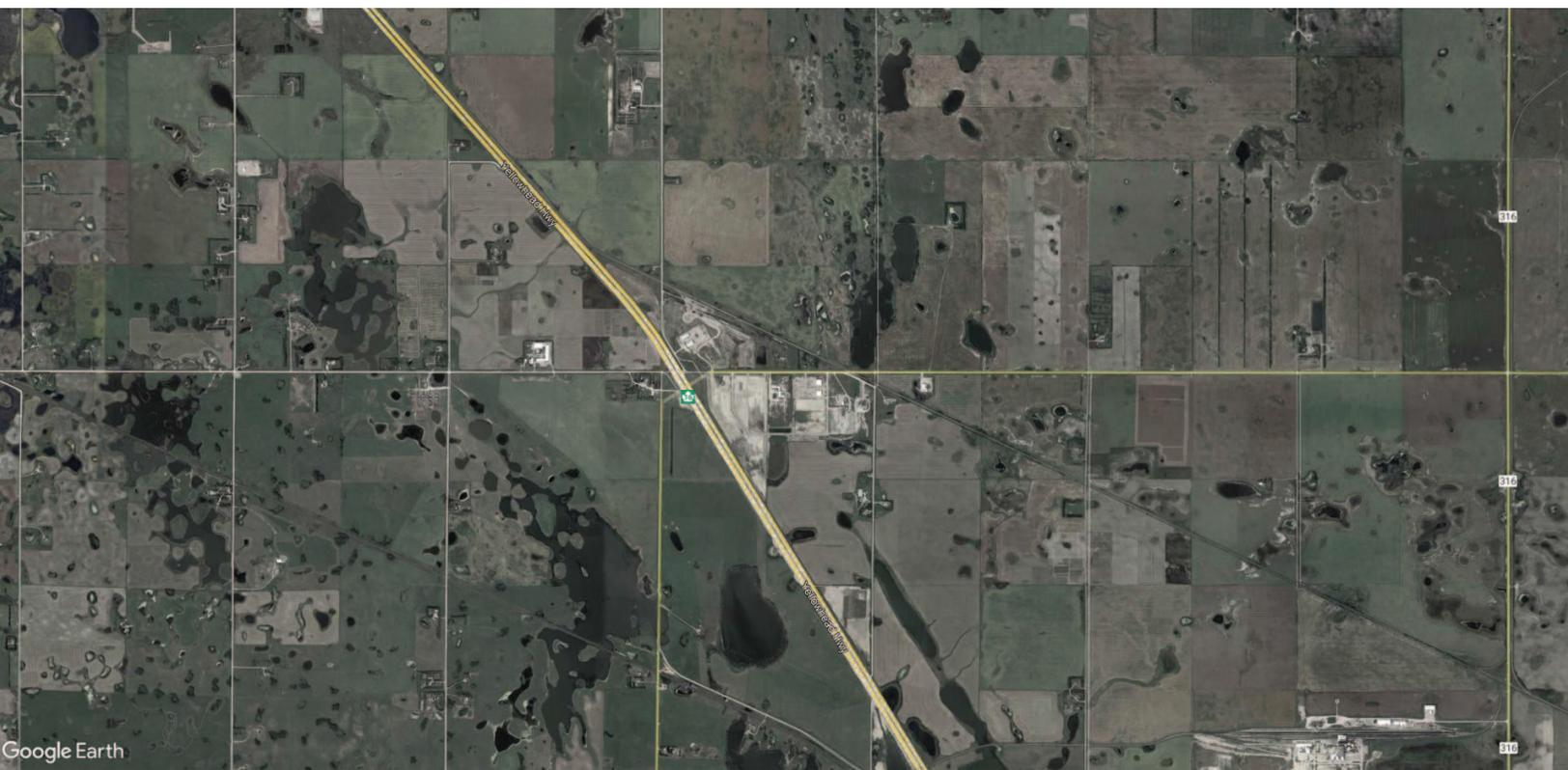
Water Security Agency response to the Drainage Plan is available in Appendix Q.



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& ASSOCIATES LTD

# **Appendix A**

## **Context Figures**







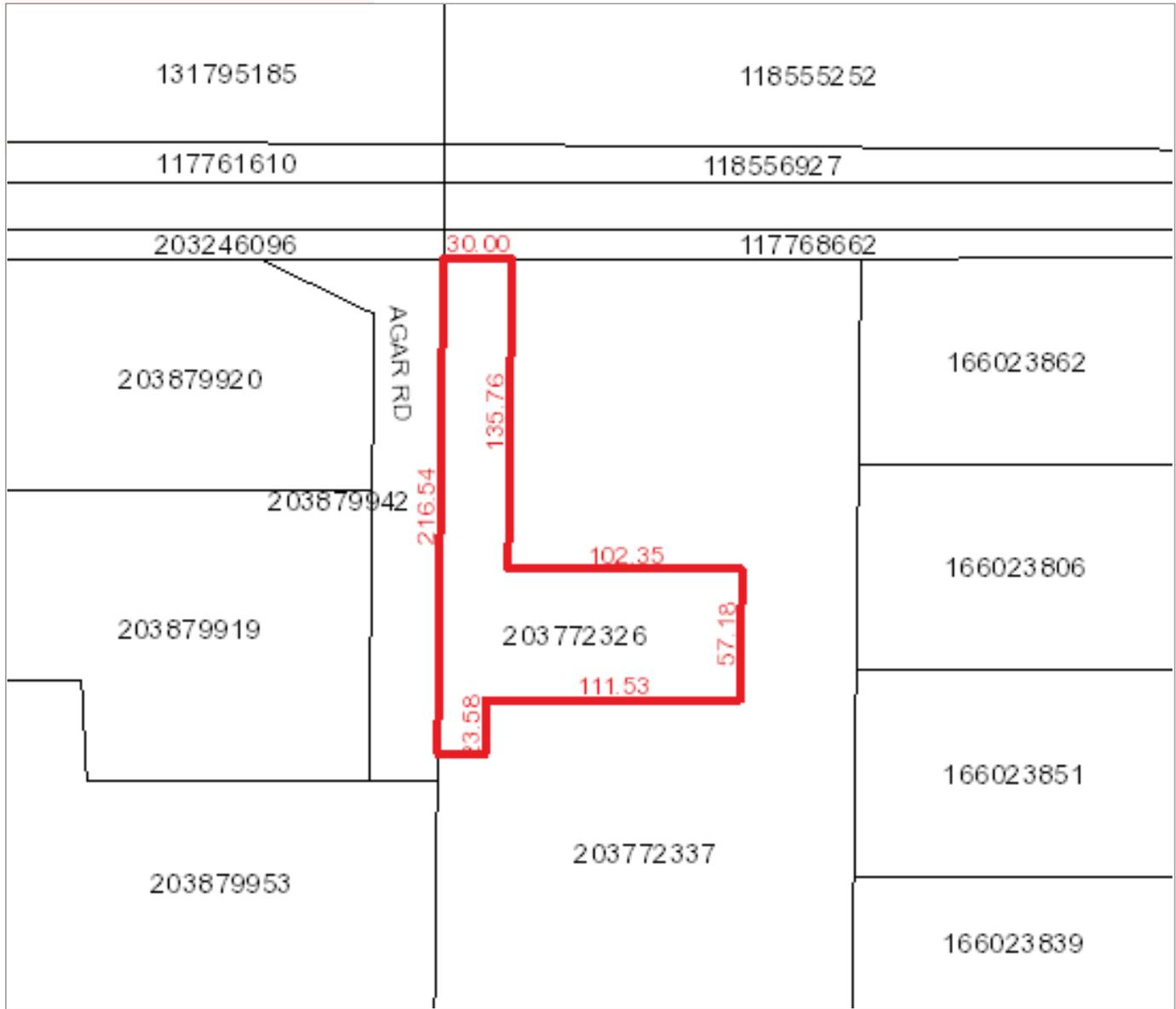
**PINTER**  
& ASSOCIATES LTD

**Appendix B**  
**ISC Parcel Boundary**



# Surface Parcel Number: 203772326

REQUEST DATE: Mon Jun 20 08:51:35 GMT-06:00 2022



**Owner Name(s) :** 101046965 SASKATCHEWAN LTD.

**Municipality :** RM OF CORMAN PARK NO. 344

**Title Number(s) :** 153230318

**Parcel Class :** Parcel (Generic)

**Land Description :** Blk/Par C-Plan 102326431 Ext 0

**Source Quarter Section :** NE-35-35-04-3

**Commodity/Unit :** Not Applicable

**Area :** 1.213 hectares (3 acres)

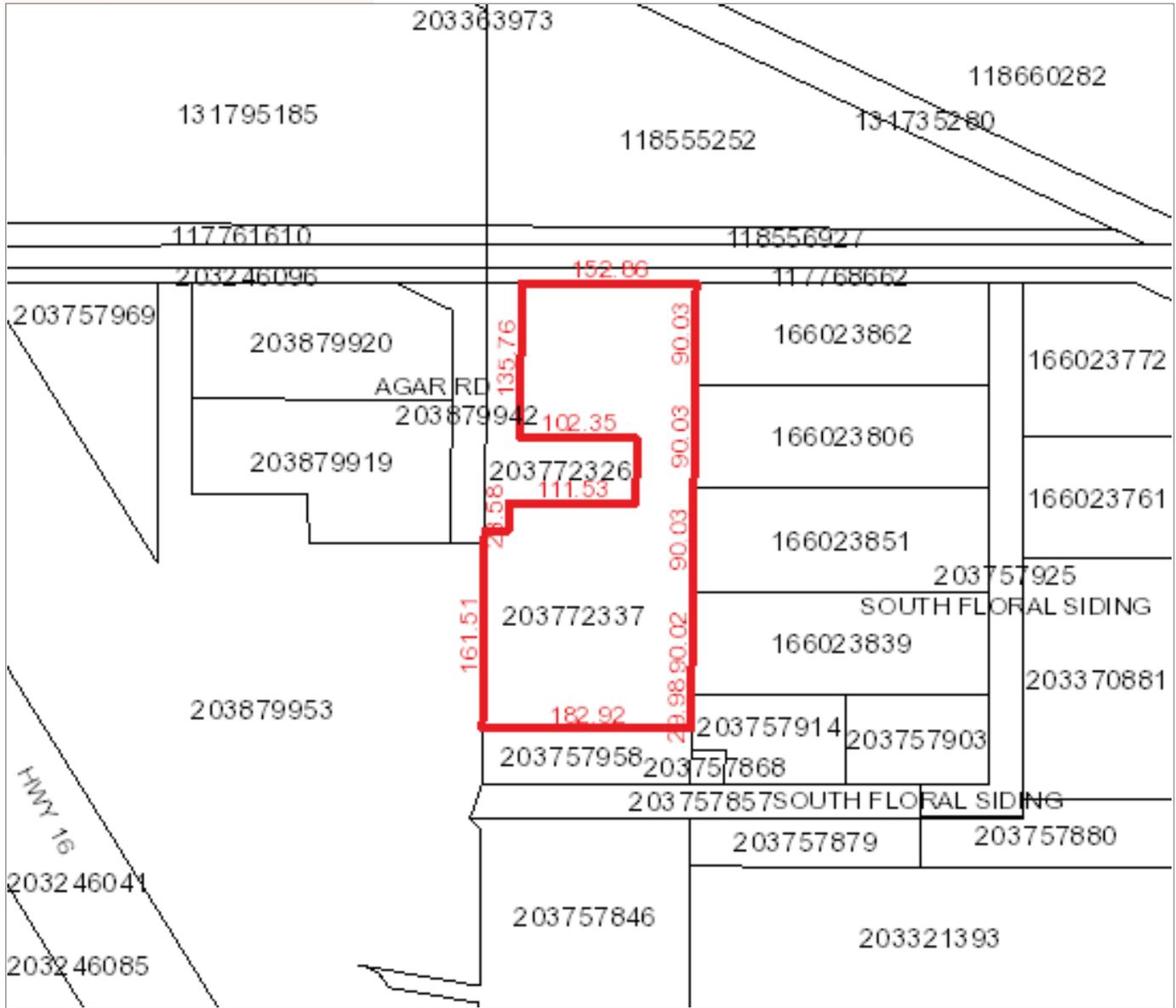
**Converted Title Number :** 99MW02289

**Ownership Share :** 1:1



# Surface Parcel Number: 203772337

REQUEST DATE: Mon Jun 20 08:50:00 GMT-06:00 2022



**Owner Name(s) :** 101046965 SASKATCHEWAN LTD.

**Municipality :** RM OF CORMAN PARK NO. 344

**Title Number(s) :** 153230329

**Parcel Class :** Parcel (Generic)

**Land Description :** Blk/Par B-Plan 98MW20997 Ext 2

**Source Quarter Section :** NE-35-35-04-3

**Commodity/Unit :** Not Applicable

**Area :** 5.92 hectares (14.63 acres)

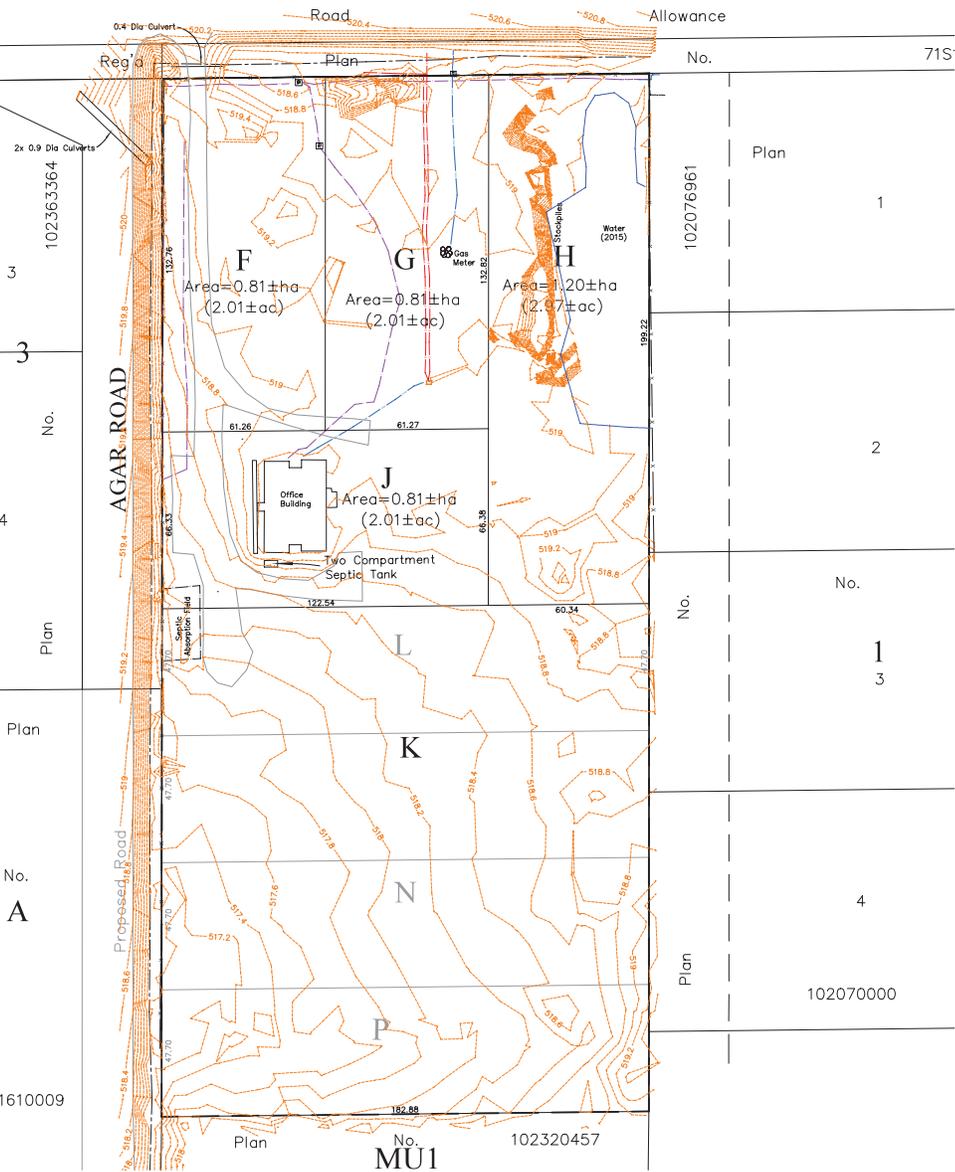
**Converted Title Number :** 99MW02289

**Ownership Share :** 1:1

## **Appendix C**

### **Topographic Survey**

Reg'd Plan No. 71S11460



PLAN SHOWING TOPOGRAPHY ON PARCEL B, REG'D PLAN NO. 98MW20997 & PARCEL C, PLAN NO. 102326431 NE 1/4 SEC. 35 TWP. 35, RGE. 4, W. 3RD MER. IN THE RM OF CORMAN PARK NO. 344 BY B.J. LUEY, S.L.S. SCALE 1:1000

Dimensions and elevations shown are in metres and decimals thereof. Elevations are Geodetic and refer to Geodetic Point Information NAD83(CRS) Datum No. BBV053, Elevation: 518.535 metres. Locations of underground services have been provided to this firm by the appropriate utilities and are therefore approximations only. Parcel currently zoned M1. Spot elevations are frozen on layer ELEVATION. Survey performed August 31st & September 1st, 2015 and March 4, 2022. -Surface features removed December 6th, 2018

Legend

- Contour
- Water
- Buried natural gas
- Buried phone
- Buried electric
- Fence
- Edge of gravel
- Sign
- Survey monument at property corner
- Telephone pedestal

Parcels F, G, H, J & K are proposed. Parcels L, M, N & P are future development.



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## **Appendix D**

### **RMCP Zoning Confirmation**

## Land Parcels



Roll	000135101.01
Rural Legal	NE-35-35-4-W3
Parcel Area	14.63
Zoning Code	<a href="#">M1</a>
Zoning Description	Light Industrial District
Electoral Area	Division 1

### Legal Details

#### Legal Details

---

Legal Details    LOT: BLK: QTR: NE SEC: 35 TWP: 35 RNG: 4 MER: 3 PLAN: 98MW20997 PID: 203772337

## Land Parcels



Roll	000135103.01
Rural Legal	NE-35-35-4-W3
Parcel Area	3
Zoning Code	<a href="#">M1</a>
Zoning Description	Light Industrial District
Electoral Area	Division 1

### Legal Details

#### Legal Details

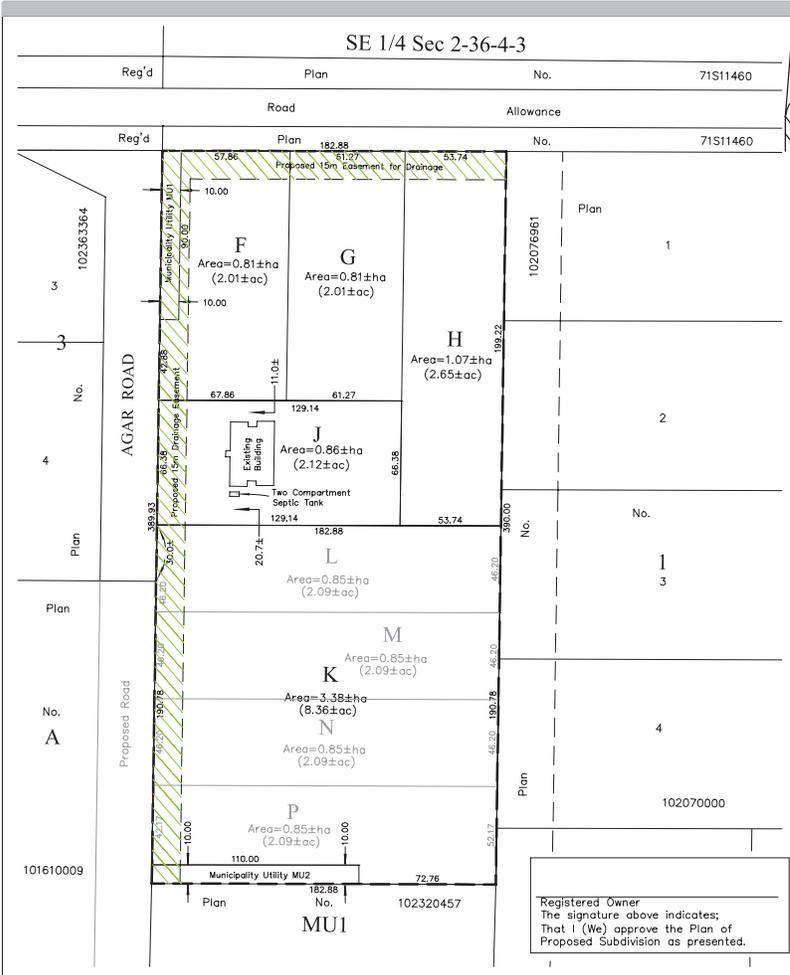
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Legal Details    LOT: BLK: QTR: NE SEC: 35 TWP: 35 RNG: 4 MER: 3 PLAN: 102326431 PID: 203772326



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**Appendix E**  
**Plan of Proposed Subdivision**



**PLAN SHOWING**

**PLAN OF PROPOSED SUBDIVISION  
OF ALL OF  
PARCEL B, REG'D PLAN NO. 98MW20997 &  
PARCEL C, PLAN NO. 102326431  
IN THE R.M. OF CORMAN PARK No. 344  
SASKATCHEWAN  
2021**

SCALE = 1: 2000

**KEY PLAN**



**NOTES**

- MEASUREMENTS ARE IN METRES AND DECIMALS THEREOF.
- SOME MEASUREMENTS ARE APPROXIMATE AND MAY DIFFER FROM THE FINAL PLAN OF SURVEY BY AS MUCH AS 5 METRES.
- PORTION TO BE APPROVED IS OUTLINED WITH BOLD DASHED LINE AND CONTAINS 7.13± ha (17.62± ac)

**SURVEYORS CERTIFICATION**

October 28, 2022  
Date  
*[Signature]*  
Saskatchewan Land Surveyor



**Abb Surveys**  
(A Division of Midwest Surveys Inc.)  
222 JESSOP AVE  
SASKATOON, SK  
S7N 1Y4  
TEL: 306-955-5330

No.	DATE	REVISION / ISSUED	JOB No.
0	10/10/2021	FOR ISSUE	
1	03/04/2022	REVISED PARCELS	
2	10/12/2022	MUNICIPALITY UTILITIES	8C-0288-21
3	10/28/2022	PROPOSED DRAINAGE EASEMENT	

3  
REVISION



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& ASSOCIATES LTD

**Appendix F**  
**Heritage Inquiry**



# Developers' Online Screening Tool

---

*Inquiry was made on February 1, 2022 at 11:56 AM*

You are inquiring about the heritage sensitivity of the following land location:

Quarter-section: NE

Section: 35

Township: 35

Range: 4

Meridian: 3

**This quarter-section is NOT heritage sensitive.**

It is not necessary to submit the project to the Heritage Conservation Branch for screening. These results can be printed for submission to other regulatory bodies (e.g. Saskatchewan Environment, Saskatchewan Energy and Resources). Please email [arms@gov.sk.ca](mailto:arms@gov.sk.ca) if you have any questions.

[Refine Search](#)

[New Search](#)

[Log Out](#)

[Contact Us](#)

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[Privacy](#)

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# **Appendix G**

## **Geotechnical Report**



PROJECT: **GEOTECHNICAL INVESTIGATION IN SUPPORT OF  
COMPREHENSIVE DEVELOPMENT REVIEW FOR  
PARCEL B AND C ON A PORTION OF NE-35-35-4 W3M IN  
THE RM OF CORMAN PARK**

PREPARED FOR: **101046965 SASKATCHEWAN LTD.**





17 March 2022

File: 22-2280

CONFIDENTIAL

101046965 Saskatchewan Ltd.  
Box 103 Site 601 RR6  
Saskatoon, SK S7K 3J9

**Re: Geotechnical Investigation in Support of Comprehensive Development Review for Parcel B and C on a Portion of NE-35-35-4 W3M in the RM of Corman Park**

Attached is a copy of our Geotechnical Investigation report for the proposed comprehensive development review located at NE-35-35-4 W3M, in the Rural Municipality of Corman Park.

If you have any questions or concerns regarding our findings, please do not hesitate to contact the undersigned at: (306)-244-1710.

Yours Sincerely,  
**PINTER & Associates Ltd.**

A handwritten signature in blue ink that reads "Kevin Mathison".

Kevin Mathison, M.Sc., P.Eng.  
Geotechnical Engineer

H:\2) Projects\2880 Floral Subdivision Development CDR\2880 Geotech\Report\Draft\2880 - Geotech Report - 14Mar22 km.docx



**CONFIDENTIAL**

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## **1.0 INTRODUCTION**

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101046965 Saskatchewan Ltd. (the Client) retained PINTER & Associates Ltd. (PINTER) to provide several services in support of a Comprehensive Development Review (CDR) for Parcels B and C on NE-35-35-04-W3 in the RM of Corman Park (the Site), including a geotechnical investigation to characterize soil and groundwater conditions in relation to foundations for structures and roads. The location of the Site is shown in Figure 1, Appendix A.

Boreholes were advanced to provide information about ground conditions and geotechnical properties within the Site. Soil samples were collected and submitted for testing to aid in the interpretation of soil conditions and properties. A piezometer was installed in each of the boreholes to provide information on groundwater conditions. Field testing was completed to supplement logged stratigraphy and laboratory testing. Borehole and piezometer locations are presented in Figure 2, Appendix A.

Appendix B presents a Glossary of Terms and Abbreviations to aid in the reading of this report.

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**2.0 METHODOLOGY**

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The geotechnical drilling investigation was carried out under the direction of PINTER personnel on 16 February 2022. Groundwater levels were observed on 08 March 2022.

**2.1. SITE SPECIFIC HEALTH AND SAFETY****2.1.1. Tailgate Meeting**

A Site Specific Health and Safety assessment was carried out prior to activities each day on site. This Health and Safety assessment identified any on-site hazards along with any requirements in terms of project health and safety. In order to ensure that all personnel on site remained safe, the programs discussed were enforced and followed.

**2.1.2. Utility Locates**

Sask 1<sup>st</sup> Call was contacted to request standard underground utility locates on the work area. Private utility locates were also requested to flag the location of a private gas line on the Site.

**2.2. BOREHOLE ADVANCEMENT**

Maple Leaf Drilling Ltd. (Maple Leaf) provided the necessary personnel, equipment and materials required to advance the geotechnical boreholes to the predetermined depths. All boreholes were advanced using solid stem augers.

Four (4) borehole locations were selected as shown in Figure 2, Appendix A (BH1, BH2, BH3, and BH4). All boreholes were advanced to a depth of approximately 12 metres (m) below ground surface (bgs). Visual logging, physical sampling, and field testing of soil strength was carried out at each borehole location. Standard Penetration Tests (SPTs) were carried out at 1.5 m intervals. Borehole Logs are presented in Appendix C.

A total of three (3) undisturbed soil samples were collected from different boreholes. In BH1 an undisturbed sample was taken at a depth of 9.0 m bgs. In both BH2 and BH3 undisturbed samples were taken at a depth of 10.5 m bgs. The undisturbed soil samples were collected in thin-walled sampling tubes (Shelby tubes) which were sealed with rubber end caps and duct tape. Grab soil samples were taken every 0.75 m, and at changes in stratigraphy, in laboratory grade polyethylene soil bags.

**CONFIDENTIAL****2.3. FIELD AND LABORATORY TESTS****2.3.1. Field Tests**

Field testing of soil samples consisted of SPTs and disturbed pocket penetrometer tests. The results of the SPT and pocket penetrometer testing are recorded in the borehole logs in Appendix C.

**Standard Penetration Test (SPT)**

The Standard Penetration Test (SPT) is carried out by driving a sampler into the soil with a known mass falling from a known height. A variety of geotechnical parameters can be correlated to the SPT-N value, which is the number of blows required to drive the sampler 300 mm into the ground, following an initial penetration of 150 mm. SPT tests are terminated prematurely if at least 150 mm of penetration cannot be achieved after 50 consecutive blows.

**Pocket Penetrometer Test**

Disturbed pocket penetrometer tests are carried out by pushing a standardized, handheld tool into the soil to a specific depth. The reading shown on the pocket penetrometer provides an approximation of the undrained unconfined compressive strength of the soil. Pocket penetrometer readings are only applicable to cohesive soils (clays and some silts).

**2.3.2. Laboratory Tests**

Water content analyses were performed on all samples gathered from the drilling program. Five (5) Atterberg limits and five (5) grain size analyses were performed on selected grab samples. Two (2) water-soluble sulfate analyses were also requested on select grab samples. All three (3) Shelby tube samples were submitted for undrained unconfined compression tests. Most of the laboratory results are included on the borehole logs in Appendix C. Complete copies of the laboratory analysis reports are also provided in Appendix D.

**Water Content**

Water content analysis is carried out by comparing the mass of a sample before and after it is dried in an oven. Water content analyses were performed at all depths within the retrieved soil samples and are used to confirm the water content and physical state of soils.

**CONFIDENTIAL**Grain Size Analysis

Grain size analysis was carried out on soil samples retrieved from various depths within the boreholes. Determination of the distribution of coarse-grained particles (sands and gravels) is performed by separating the soil grain-size fractions by dry mechanical sieving through a series of sieves with progressively smaller openings. Distribution of fine-grained particles (clays and silts) is determined through the use of a pipette method which takes advantage of the predictable relationship between particle size and the settling velocity in a fluid. The results of both methods are combined to determine the relative amounts of gravels, sands, silts, and clays in the soil, and to confirm soil classification.

Atterberg Limits

The Atterberg limits consist of the liquid limit and the plastic limit. They represent the water content at which a fine-grained soil begins to act as a liquid and a plastic respectively. Atterberg limits tests were performed on soil samples retrieved from various depths within the boreholes and were used to determine approximate soil characteristics such as settlement/swell potential of clays, and to confirm soil classification.

Undrained Unconfined Compressive Strength

Unconfined Compressive Strength (UCS) tests are performed by applying load in the axial direction, at a constant strain rate, with no confining force in the horizontal direction. UCS tests were carried out on undisturbed samples to determine the cohesive strength of the soils. Cohesion is an important strength property of clay dominated soils.

Density

The bulk density of a soil is a measure of the density of a soil at its natural, in situ moisture content. Dry density is the density of a soil that has had all the water removed. Both are measured from undisturbed soil samples and can be used as an indication of soil compaction and strength, as well as to calculate overburden pressures at specific depths. The density results are reported as part of the UCS results or can be determined independently.

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Water-Soluble Sulfate

Sulfate in soil has a deleterious effect on concrete. The water-soluble sulfate analysis measures the amount of water soluble sulfate in soil and is used to determine what grade, if any, of sulfate resistant cement should be used for concrete in direct contact with the soil.

ALS Canada Limited of Saskatoon, SK provided laboratory analysis for particle size, Atterberg Limits, and moisture content. SNC-Lavalin Group Inc. of Saskatoon, SK provided testing for UCS.

**2.4. GROUNDWATER MONITORING**

Groundwater levels were monitored on 08 March 2022. Groundwater levels were measured using a Heron electronic interface probe.

**2.5. BOREHOLE COORDINATES**

Borehole coordinates were recorded at the time of drilling using a smartphone-based GPS app. The accuracy of these measurements varies, but is typically about +/- 6 m.

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## **3.0 SOIL DESCRIPTIONS AND ANALYSIS**

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### **3.1. SITE SETTING**

The Site is located on NE-35-35-4 W3M in the RM of Corman Park and is part of the Floral Industrial Subdivision. The lot is located approximately 800 m east of Highway 16 and is currently occupied by Quantum Genetix.

Selected Site photographs are presented in Appendix E.

### **3.2. STRATIGRAPHY**

In general, the site stratigraphy consisted of 0 to 3 m of clayey silt overlying a distinct deposit of silt and clay that extended to a depth between 4.5 and 7.5 m. Following these layers was a very stiff, sandy and silty till that extended to the maximum depth of investigation in all holes. An intertill sand seam was encountered in BH4 between the depths of 6.0 and 7.5 m bgs.

### **3.3. FIELD RESULTS**

#### **3.3.1. Standard Penetration Tests (SPT)**

The standard penetration test (SPT) is an in-situ dynamic penetration test designed to provide the penetration resistance (N-value) along the depth at a given site. SPT-N values generally increased with depth, averaging about 9 within the clayey silt, 11 within the silt and clay, and 23 within the till. SPT results are presented in the borehole logs provided in Appendix C.

#### **3.3.2. Pocket Penetrometer**

The units of  $\text{kg}/\text{cm}^2$  given by a pocket penetrometer are approximately equal to 100 kPa and represent an estimation of the UCS of the soil, which is approximately equal to twice the undrained shear strength. Pocket penetrometer readings were generally consistent within distinct stratigraphic layers, averaging approximately 1.5 in the clayey silt, and silty clay layers, and increasing to about 3.0 in the till. Pocket penetrometer readings are presented in the borehole logs in Appendix C.

#### **3.3.3. Groundwater**

Groundwater levels were measured on 08 March 2022 and are presented in Table 1.

**CONFIDENTIAL****TABLE 1: Groundwater Levels**

Piezometer	Screen Depth (m bgs)	Depth to Water (m bgs)	Depth of Pipe (m bgs)
PZ1	8.75 – 11.75	10.003	11.925
PZ2	9.0 – 12.0	1.225	12.163
PZ3	9.0 – 12.0	1.300	12.0
PZ4	4.25 – 7.25	2.947	7.25

The stand up pipe on PZ3 broke off at the surface while monitoring water levels. A blockage that was presumed to be ice was encountered in PZ3 at a depth of 1.300 m bgs. PZ4 was silted in to a depth of 5.774 m bgs at the time of groundwater monitoring.

### 3.4. LABORATORY RESULTS

#### 3.4.1. Unconfined Compressive Strength

Three (3) undisturbed samples were submitted for testing of UCS. The results are summarized in Table 2. The complete laboratory results are provided in Appendix D.

**TABLE 2: Unconfined Compressive Strength Results**

Sample ID	UCS (kPa)	Consistency
BH1@9m	173	Stiff
BH2@10.5m	92	Medium
BH3@10.5m	88	Medium

**CONFIDENTIAL****3.4.2. Density**

The density results are summarized in Table 3.

**TABLE 3: Density Results**

Sample ID	Bulk Density (kg/m <sup>3</sup> )	Dry Density (kg/m <sup>3</sup> )
BH1@9m	2234	1999
BH2@10.5m	2249	1967
BH3@10.5m	2296	2058

**3.4.3. Grain-Size and Atterberg Limits**

Table 4 summarizes the grain-size and Atterberg limit laboratory results.

All samples were classified according to the Unified Soil Classification System (USCS). The upper layer of clayey silt is classified as a low plasticity clay (CL), while the layer of silt and clay is classified as a high plasticity clay (CH). Two grain-size distributions were performed on the till, resulting in 48% and 51% fines respectively. This puts the till right on the borderline between being classified as a low plasticity clay, or a clayey sand. The sand layer encountered within the till in BH4 is classified as a silty, clayey sand.

**TABLE 4: Grain Size and Atterberg Limit Results**

Sample ID	Water Content (%)	USCS Particle Sizes			Atterberg Limits			USCS Classification
		Fines (%)	Sand (%)	Gravel (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	
BH3-2	21.5	85	15	0	42.3	20.8	21.5	CL
BH2-3	27.4	99	1	0	56.9	26.3	30.6	CH
BH1-9	11.3	51	43	6	29.1	14.9	14.2	CL
BH4-9	14.9	39	58	2	19.7	13.4	6.3	SC-SM
BH4-15	15.1	48	42	10	24.7	13.1	11.6	SC

USCS: Unified Soil Classification System

CL: Low Plasticity Clay

CH: High Plasticity Clay

SC-SM: Silty, Clayey Sand

SC: Clayey Sand

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**4.0 GEOTECHNICAL PARAMETERS**

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**4.1. UNCONFINED COMPRESSIVE STRENGTH**

The pocket penetrometer is used to measure the approximate value of the UCS, which equals approximately one hundred times the pocket penetrometer readings, in kPa (note that the scale of the pocket penetrometer maxes out at 4.5 kg/cm<sup>2</sup>, or 450 kPa). The pocket penetrometer indicated a UCS value averaging approximately 150 kPa in the upper clayey silt and silty clay layers. An average value of 130 kPa was measured between the three different Shelby tube samples in the till.

**4.2. UNDRAINED SHEAR STRENGTH**

The undrained shear strength ( $s_u$ ) can be approximated as half the UCS for cohesive soils. Therefore, the approximate  $s_u$  of the soils at the depth of typical shallow foundations is 75 kPa, and 65 within the recommended depth range for deep foundations.

**4.3. EFFECTIVE FRICTION ANGLE**

The effective friction angle ( $\phi'$ ) can be correlated to a variety of other data, including SPT values and soil plasticity index ( $I_p$ ). Many of these correlations are highly dependent on very specific soil characteristics (eg. grain size distribution) and therefore a certain amount of engineering judgement must be applied when using them to estimate  $\phi'$  values. A large amount of literature also exists which provides approximate  $\phi'$  values based on various soil properties.

Using all of the information available, including applicable correlations and literature review, a  $\phi'$  value of 25° was selected as representative for the upper clayey silt and silty clay layers at the site. A value of 28° was selected as representative of the till.

**4.4. EFFECTIVE COHESION**

The effective cohesion ( $c'$ ) can be roughly correlated to either  $I_p$  or  $s_u$ . The correlation to  $I_p$  is considered poor because the physical characteristics that determine  $I_p$  are fundamentally different from those that determine  $c'$  and therefore the correlation to  $s_u$  was used.

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The estimated  $c'$  value, based on the correlation to  $s_u$  is 7.5 kPa within the upper clayey silt and silty clay layers, and 6.5 kPa within the till.

**4.5. COMPRESSION INDEX**

The test to determine compression index ( $C_c$ ) can take up to several weeks and is expensive. For a project of this scope the extra time and expense is generally not warranted. For this reason  $C_c$  was estimated based on a correlation to  $I_p$ , literature review, and experience.

A value of 0.42 was selected in the upper clayey silt and silty clay layers, and 0.15 was selected in the till.

**4.6. RECOMPRESSION INDEX**

The recompression index ( $C_r$ ) was estimated from the value of  $C_c$ . Typically,  $C_r$  is between  $1/5^{\text{th}}$  and  $1/10^{\text{th}}$  the value of  $C_c$ . A conservative value of  $1/5^{\text{th}}$  was chosen, resulting in a selected  $C_r$  value of 0.084 in the upper clayey silt and silty clay layers, and 0.030 in the till.

**4.7. RESISTANCE FACTORS**

The Canadian Foundation Engineering Manual (CFEM) recommends that the limit states design methodology be used for design of structural foundations. The limit states design methodology uses factored parameters to determine allowable design loads and resistances. The recommended geotechnical resistance factor ( $\Phi$ ) for shallow foundations designed using semi-empirical analysis based on laboratory and in situ test data is 0.5. The recommended  $\Phi$  for deep foundations designed using semi-empirical analysis based on laboratory and in situ test data is 0.4 for bearing resistance, and 0.3 for uplift resistance.

This report presents the geotechnical design parameters with these factors already applied. Bearing capacity values recommended in this section are for typical foundation systems at the specified depths, which may change according to design specific purposes. They have been estimated based on the field and lab testing results, as well as reasonable estimates of soil properties for the Site specific soils. Actual bearing capacities will vary slightly based on the geometries and depths of the designed foundations.

**CONFIDENTIAL****4.8. GEOTECHNICAL PARAMETERS SUMMARY**

Table 5 presents a summary of the geotechnical parameters used for foundation design of this project, based on the above analyses.

**TABLE 5: Geotechnical Parameters**

Parameter	Value	
	Shallow	Deep
UCS	150 kPa	130 kPa
$s_u$	75 kPa	65 kPa
$\phi'$	25°	28°
$c'$	7.5 kPa	6.5 kPa
$C_c$	0.42	0.15
$C_r$	0.084	0.030
$\Phi$ (shallow foundations)	0.5	
$\Phi$ (deep foundations – compression)	0.4	
$\Phi$ (deep foundations - uplift)	0.3	

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**5.0 SHALLOW FOUNDATION ANALYSES**

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**5.1. SHALLOW FOUNDATION TYPE AND DEPTH**

The soils at this site are likely extremely susceptible to frost heave and settlement, and therefore shallow foundations are not recommended at this location. If shallow foundations are required strip footings are the recommended type, and they should be situated at a depth of at least 1.5 m bgs.

**5.2. BEARING RESISTANCE – DRAINED LOADING**

Drained loading occurs when the application of load to the foundation is gradual enough to allow pore water pressures within the bearing soil to dissipate. The main soil parameters that determine the bearing resistance for drained loading are effective cohesion ( $c'$ ), and effective friction angle ( $\phi'$ ). The factored geotechnical bearing resistance at a depth of 1.5 m bgs for a typical shallow foundation at this site, calculated using these values, is 250 kPa.

**5.3. BEARING RESISTANCE – UNDRAINED LOADING**

Undrained loading occurs when rapid loading of foundations does not allow time for pore water pressures within the soil to dissipate. Undrained loading most often occurs in cohesive soils and results in an overall reduction of bearing resistance. In some cases, the bearing resistance under undrained conditions governs the allowable bearing resistance of the soil. The main soil parameter that determines the bearing resistance for undrained loading is the undrained shear strength of the soil ( $s_u$ ). Using this value, the factored geotechnical bearing resistance for this site, based on undrained loading, for a typical shallow foundation at 1.5 m bgs, is 145 kPa.

**5.4. SETTLEMENT**

The generally accepted maximum allowable settlement for serviceability limit states of most structures is 25 mm. Using the estimated  $C_c$  and  $C_r$  values for a shallow foundation of the type and depth described above, a bearing pressure of 30 kPa is predicted to be the maximum bearing pressure that will result in a total settlement of less than 25 mm.

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**5.5. GENERAL SHALLOW FOUNDATION RECOMMENDATIONS**

- i. Materials directly beneath the shallow foundation footings should be excavated and replaced with a free draining granular material to a thickness of at least 1 m. The free draining material should be compacted to a minimum 100% of standard proctor density at optimum moisture content (SPDD).
- ii. Provide 100 mm minimum diameter continuous weeping tile encased in a non-woven geotextile installed around the perimeter of the foundation base. A minimum of 300 mm free draining aggregate cover should be provided above the weeping tile.
  - a. Free draining granular material should be placed a minimum of 1.5 m above the weeping tile aggregate, or half way up the foundation wall, whichever is greater. The granular material should be free draining. Allowance should be made for settlement of the fill.
  - b. Free draining granular shall contain less than 5% material finer than 0.075 mm.
- iii. Where deleterious materials such as soft/wet soils, organics, frozen material, rocks, etc. are encountered, these materials should be removed and replaced with gravel fill compacted to a minimum 100% SPDD, or lean concrete with a compressive strength of at least 2 MPa.
- iv. Excessive wetting, drying, or freezing of exposed soils at the footing elevation during construction should be avoided. If exposed soils do become excessively wetted, dried, or frozen, they should be removed and replaced with compacted granular fill, or lean concrete.
- v. Provide a polyethylene vapor barrier between the granular base and the reinforced concrete floor slab.
- vi. Shallow foundations slabs should be reinforced to minimize effects of seasonal movements, and non-uniform bearing surfaces.
- vii. Isolate the slab from grade beams, walls, columns by means of separation joints.
- viii. Exterior below grade insulation should be installed to prevent freezing of the soil beneath the building footprint. A minimum temperature level should also be maintained within the proposed structures during the winter months.

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- ix. Backfilling against foundations should not be attempted until the concrete has cured enough to provide sufficient strength to resist the loads caused by lateral earth pressure and compaction.
- x. No organic, frozen, or other deleterious materials should be used in the backfill. Any soil clumps should be broken up.
- xi. Backfill around foundations should be placed in 150 mm lifts and compacted to at least 100% SPDD
- xii. Positive drainage should be provided with a slope of at least 1% to shed water away from structures and prevent pooling against foundations.

**5.6. SPECIFIC SHALLOW FOUNDATION RECOMMENDATIONS**

Due to the generally poor quality of the native soils and their susceptibility to frost heave and settlement, shallow foundations are not recommended for this location.

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## 6.0 DEEP FOUNDATIONS ANALYSES

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### 6.1. DEEP FOUNDATION TYPE AND DEPTH

Based on the soil types and ground conditions encountered, Cast-In-Place concrete piles are recommended for this location. Circular piles of at least 300 mm diameter were assumed for these analyses. In order to develop their full capacity, it is recommended that piles be driven to a depth of at least 8.0 m bgs.

### 6.2. END BEARING RESISTANCE

The factored geotechnical end bearing resistance for the recommended piles at various depths is given in Table 6.

**TABLE 6: Factored Geotechnical End Bearing Resistance**

Depth (m bgs)	Factored Geotechnical End Bearing Resistance (kPa)
6	130
8	225
10	960
12	1255

### 6.3. SKIN FRICTION BEARING RESISTANCE

There are two approaches to evaluate the resistance of a pile in cohesive soils:

- the total stress approach (also known as the  $\alpha$ -method) relies on the undrained shear strength ( $s_u$ ) and an adhesion coefficient ( $\alpha$ ) derived from empirical relationships; and
- the effective stress approach (or  $\beta$ -method) relies on the vertical effective stress ( $\sigma'_v$ ) and a combined shaft resistance factor ( $\beta$ ) derived from the friction angle of the soil and the interface friction angle between the soil and the pile.

The CFEM presents both methods but cautions against the total stress approach: “Empirical correlations between  $s_u$  and the toe-and-shaft resistance on a pile have been

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developed, but these have not proved reliable, particularly for  $s_u$  in excess of 25 kPa. Therefore, analysis in terms of effective stresses is more rational.”<sup>1</sup>

Table 7 provides the factored geotechnical shaft resistance for the recommended pile type according to depth based on the CFEM effective stress approach. The top 2 m of soil is assumed not to contribute to the shaft resistance due to potential effects of swelling and shrinking in clay particles.

**TABLE 7: Factored Shaft Resistance**

Depth Range (m bgs)	Factored Downward Shaft Resistance (kPa)	Factored Upward Shaft Resistance (kPa)
0 - 2	0	0
2 - 4	5	4
4 - 6	8	6
6 - 8	11	8
8 - 10	14	10
Below 10	17	13

**6.4. LATERAL LOAD RESISTANCE**

Lateral loads due to wind may govern the design of deep foundations for the proposed Structure. Deep foundation’s resistance to lateral loads is highly dependent on the pile design and geometry. For an 8 m deep pile with 0.3 m diameter, the Ultimate Lateral Resistance is estimated to be 36.0 kN.

If required, PINTER may be contracted to evaluate the lateral resistance of the specified pile design.

**6.5. GENERAL PILE RECOMMENDATIONS**

The following minimum recommendations are presented for pile installation and construction:

1. All piles should be drilled and poured in a single continuous operation.
2. The pile base should be cleaned to the best ability of the equipment being used and in accordance with standard industry best practices.

<sup>1</sup> *Canadian Foundation Engineering Manual 4<sup>th</sup> Edition – Canadian Geotechnical Society, 2006.*

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3. Concrete should not be freely poured into standing water.
4. Concrete should be vibrated for the full length of the pile to eliminate the potential development of voids between the ground and the pile.
5. The contractor should be prepared to case the augered holes to prevent sloughing of the soil and the interference with pile integrity that such conditions would cause.
6. If centre-to-centre spacing of less than 6.0 pile diameters is used, pile group effects will alter the overall bearing resistance of the individual piles. PINTER should be contacted in this case to review final foundation design.

**6.6. SPECIFIC DEEP FOUNDATION RECOMMENDATIONS**

Based on the above analyses, cast-in-place concrete piles would provide a suitable foundation for the proposed structures at this location.

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**7.0 HELICAL SCREW PILE ANALYSES**

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**7.1. HELICAL PILE BEARING RESISTANCE**

The total resistance of a helical pile is evaluated as the sum of the resistances of each individual helical plate. Skin friction along the shaft of screw piles is not generally taken into account unless the shaft diameter is greater than 100 mm. The factored geotechnical bearing resistance of an individual helical plate of 0.6 m diameter at 8 m depth is estimated to be 220 kPa. This value considers undrained loading, which governs in this instance. The bearing resistance did not vary appreciably at any depth within the till up to 12 m bgs.

**7.2. LOAD CAPACITY IN RELATIONSHIP TO INSTALLATION TORQUE – SCREW PILES**

A screw pile's bearing resistance may be estimated by monitoring the torque required to install the pile. Recording of installation torque should always be done when installing screw piles as a quality control step to ensure that piles have reached their expected capacity. The required torque to ensure the expected resistance has been reached is dependent on soil conditions and screw pile design, including plate and shaft diameter. If screw piles are selected, once a screw pile design has been confirmed, PINTER should be contacted to review the design and specify a required torque during construction.

**7.3. SCREW PILES RECOMMENDATIONS**

1. All piles should be drilled in a single continuous operation.
2. The minimum vertical depth below ground surface of any helical plate is 5.0 plate diameters.
3. The minimum vertical spacing between helical plates is 3.0 plate diameters.
4. The centre-to-centre spacing between individual screw piles must be a minimum of 3.0 helical plate diameters. A spacing of at least 5.0 plate diameters is recommended.

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5. For a given shaft length, use fewer longer extensions rather than many shorter extensions. This will result in fewer connections.

**7.4. SPECIFIC HELICAL SCREW PILE FOUNDATION RECOMMENDATIONS**

Based on the above analyses, helical screw piles would provide a suitable foundation for the proposed structures at this location.

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## **8.0 SITE PREPARATION**

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### **8.1. GRADING AND DRAINAGE**

Proper grading and positive drainage are paramount for a long-term performance of both structural and pavement designs. Maintaining a positive grade draining away from structures and avoiding standing water after development is critical. A minimum slope of 0.5% leading to catch basins, ditches or sewers is recommended. Better performance is generally achieved with minimum slopes of at least 1% away from structures in subgrades, sub-base, base, and top of road surfaces, as some post-construction settlement is likely to occur.

### **8.2. FILL SELECTION AND PLACEMENT**

The silty nature of the soils at the Site indicates an increased susceptibility to frost heave. It is for these reasons that a well-draining granular material should be used below the foundations of structures and roads.

The thickness of the granular material will vary depending upon the weight and load distribution of the structure resting on the soil. Shallow foundations will require more granular material than deep foundations. Heavy loads will require granular support of at least 1 m thick placed at a Standard Proctor Density of 100%.

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**9.0 GRANULAR DESIGN**

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**9.1. SUBGRADE**

A uniformly smooth subgrade surface should be prepared for the subgrade support of all paved areas. Prior to placing the base course, all deleterious material should be removed and wasted. Where any imperfections (loose soil, potholes, etc.) that can retain water on the surface exist, they should be disposed of prior to placement of road structures. As a minimum, the soils in all areas supporting vehicle traffic should be sub-cut below design subgrade elevations (a minimum of 300 mm) and re-compacted to provide a uniform bearing condition.

The prepared subgrade should be cross-sloped to facilitate the flow of surface water off the roadway/parking area. A minimum of 2.5 % cross-slope is recommended along roadways and 1% in parking areas directed away from buildings and tanks.

The top 300 mm of the subgrade should be scarified and re-compacted to 100% of the Standard Proctor Maximum Dry Density ( $\pm 2\%$  of the optimum moisture content). The lateral extent of over-excavation should be at least 1.5 m. All fill soils placed to raise the subgrade elevation to design grade should be placed in loose lifts (150 mm maximum thickness), moisture conditioned, and compacted as outlined above.

Subgrade preparation should not be performed on very soft, loose or wet subgrade, as construction equipment may further weaken the subgrade. A uniform bearing condition should be created by proof rolling the subgrade.

**9.2. SUB-BASE COURSE**

It is recommended that Sub-base course material in compliance with one of the design types shown in Table 8 be used.

**CONFIDENTIAL****TABLE 8: Sub-base Course Gradations<sup>2</sup>**

Sieve Size (mm)	% Passing by Weight		
	Type		
	6	8	10
50.0	100.0	100	100
2.0	0 - 80	0 - 90	-
0.400	0 - 45	0 - 60	-
0.160	0 - 20	0 - 25	-
0.071	0 - 6	0 - 15	0 - 20
Plasticity Index	0 - 6		

A tolerance of 3% in the percent by weight passing the maximum size sieve shall be permitted providing 100% of the oversize passes the 63.0 mm sieve.

Sub-base mix shall be spread on dry and unfrozen surfaces and shall not be compacted if the atmospheric temperature is less than 2 °C.

### 9.3. BASE COURSE

Base aggregate shall be composed of sound, hard and durable particles of sand, gravel and rock free from injurious quantities of elongated, soft or flaky particles, shale, loam, clay balls and organic or other deleterious material. It is recommended that the base course material used on the Site adhere to one of the design types specified in Table 9.

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<sup>2</sup> Reference: Saskatchewan Ministry of Highways and Infrastructure Standard Specifications Manual –Section 3300

**CONFIDENTIAL****TABLE 9: Base Course Gradations<sup>3</sup>**

Sieve Size (mm)	% Passing by Weight		
	Type		
	31	33	35
31.5	100.0	-	-
18.0	75 - 90	100	100
12.5	65 - 83	75 - 100	81 - 100
5.0	40 - 69	50 - 75	50 - 85
2.0	56 - 47	32 - 52	32 - 65
0.900	17 - 32	20 - 35	20 - 43
0.400	12 - 22	15 - 25	15 - 30
0.160	7 - 14	8 - 15	8 - 18
0.071	6 - 11	6 - 11	7 - 12
Plasticity Index	0 - 7	0 - 6	0 - 5
Fractured Face %	50.0 Minimum		
Light Weight Pieces %	5.0 Maximum		

A tolerance of 3% in the percent by weight passing the maximum size sieve shall be permitted providing 100% of the oversize passes the 40.0 mm sieve for Type 31 base course and the 22.4 mm sieve for Types 33 and 35 base course.

Base mix shall be spread on dry and unfrozen surfaces and shall not be compacted if the atmospheric temperature is less than 2 °C.

#### 9.4. MOISTURE CONTROL

If excess moisture originating from external causes, including but not limited to precipitation and/or Contractor's operation, is present in the subgrade and/or granular material prior to the acceptance of the completed surfacing structure; the Contractor shall dry the subgrade and/or granular material to the optimum moisture content and compact the subgrade and/or granular material to not less than the specified density

<sup>3</sup> Reference: Saskatchewan Ministry of Highways and Infrastructure Standard Specifications Manual –Section 3500

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## **10.0 PAVEMENT DESIGN**

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### **10.1. PARKING/ROAD STRUCTURE**

It is assumed that the parking/road structures will need to accommodate heavy truck traffic for deliveries. A rough estimate of the California Bearing Ratio (CBR) near the surface is 3.0, based on Atterberg limits and grain size data. From this a minimum pavement structure is inferred:

- Asphalt concrete thickness of 100 mm,
- Base Course thickness of 250 mm, and
- Sub-base course thickness of 500 mm.

Alternatively, the structure may be built without asphalt as follows:

- Base Course thickness of 350 mm, and
- Sub-base course thickness of 550 mm.

The surface of the parking/road structure should be sloped and contoured to direct surface water runoff away from the buildings. It is recommended that hot mix aggregate material be based on one (1) of the available design types listed in Table 10.

**CONFIDENTIAL****TABLE 10: Asphalt Concrete Mix Design<sup>4</sup>**

Mix Design Type	1	2	3
Sieve Size (mm)	70 or 70 R	71 or 71 R	72 or 72 R
18.0	100	-	-
16.0	78 - 98	100	100
12.5	68 - 92	78 - 98	78 - 98
9.0	54 - 80	66 - 90	66 - 90
5.0	38 - 65	46 - 72	46 - 72
2.0	18 - 46	23 - 51	23 - 51
0.900	10 - 33	15 - 37	15 - 37
0.400	5 - 25	10 - 27	10 - 27
0.160	3 - 13	3 - 14	3 - 14
0.071	2 - 9	2 - 9	2 - 9
Air Voids, %		3 - 5	
Air Voids (Field), %		4 - 9	
Deleterious Material Max, %		2	
Film Thickness Min, um		7.5	
Flow, mm		1.5 - 3.5	
Fracture, Min %	60	70	80
Lightweight Aggregate, Max %		1	
Retained Stability, Min %		70	
Sand Equivalent, Min		45	

<sup>4</sup> Reference: Saskatchewan Ministry of Highways and Infrastructure Standard Specifications Manual –Section 4100

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**11.0 FOUNDATION CONCRETE DESIGN**

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PINTER has provided general concrete design recommendations below. Specific concrete foundation design recommendations should be made by a qualified structural engineer as it is outside the geotechnical engineering scope of work.

1. All concrete and concrete materials should be supplied, tested, and installed according to CSA 23.1.
2. All concrete should have a minimum 28-day compressive strength of 30 MPa.
3. The base below the concrete must be free from deleterious material including cuttings from excavations, organics, frozen material, and rocks.
4. Concrete slabs should be underlain by free draining material. The top layer of material between the base of the concrete and the granular material should consist of a 50 mm uniform sand layer to allow for even load distribution of the structure.
5. Air entrainment (4%-7%) should be used for all outside concrete.
6. Water reducers are recommended to assist with workability without compromising concrete strength.
7. Based on the results of the water-soluble sulfate analysis, the sulfate exposure for concrete in contact with the soil at this location is classified as severe. Therefore, PINTER recommends the use of sulfate resistant cement with all concrete in contact with soil.
8. Concrete slabs should be designed with 2 mats of rebar, the bottom mat for compression from loadings and the top mat from tension due to potential frost action.

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## **12.0 CONSTRUCTION AND INSPECTION**

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The design recommendations within this report are based on the assumption that a sufficient level of inspection will be provided during construction and that qualified and experienced contractors will carry out construction.

PINTER should be retained for design review and engaged for inspection (and materials testing as required) during foundation and paving installation.

A sufficient level of inspection is considered to be full time. This is to confirm that site conditions encountered are consistent with subsurface interpretations, the assumptions used to develop design recommendations, and the findings of this investigation. This will help to assure that cost effective solutions are developed for any construction problems that may arise.

PINTER requests the opportunity to review drawings and specifications related to any foundations, earthworks or other designs based on the recommendations provided in this report.

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## 13.0 LIMITATIONS

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**This report has been prepared for the exclusive use of 101046965 Saskatchewan Ltd. Any use of this report by a third party, or any reliance on or decisions to be made based on it, is the responsibility of such third parties. PINTER & Associates Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.**

**The findings and recommendations provided in this report were prepared in accordance with generally accepted professional engineering principles and practices. No other warranty, express or implied is made.**

**The results, findings and recommendations of this report are based on the results of field observations and laboratory analysis. Interpolation of soil and groundwater conditions has been made between borehole locations. Actual conditions may vary from those interpreted by PINTER. If conditions are encountered that differ from those detailed by the boreholes drilled onsite and described in this report, or if the assumptions stated in this report are not in keeping with the design, PINTER should be notified in order to review and adjust the recommendations, if necessary.**

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Where construction is undertaken based upon the recommendations of this report, PINTER should be notified and provided the opportunity to review designs or onsite inspection. Where PINTER is not afforded the opportunity for revision and/or inspection, PINTER makes no warranty regarding the interpretation of this report and the recommendations contained herein.

**PINTER & Associates Ltd.**



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**Kevin Mathison, M.Sc., P.Eng.  
Geotechnical Engineer**



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**Remi Valois, P.Eng.  
Geotechnical Engineer**

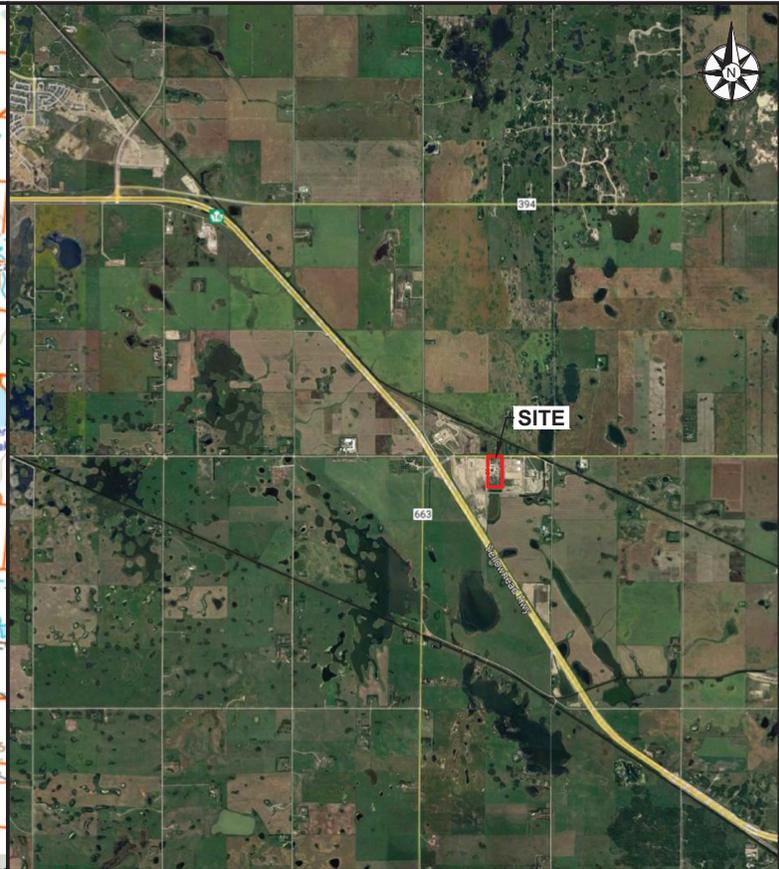
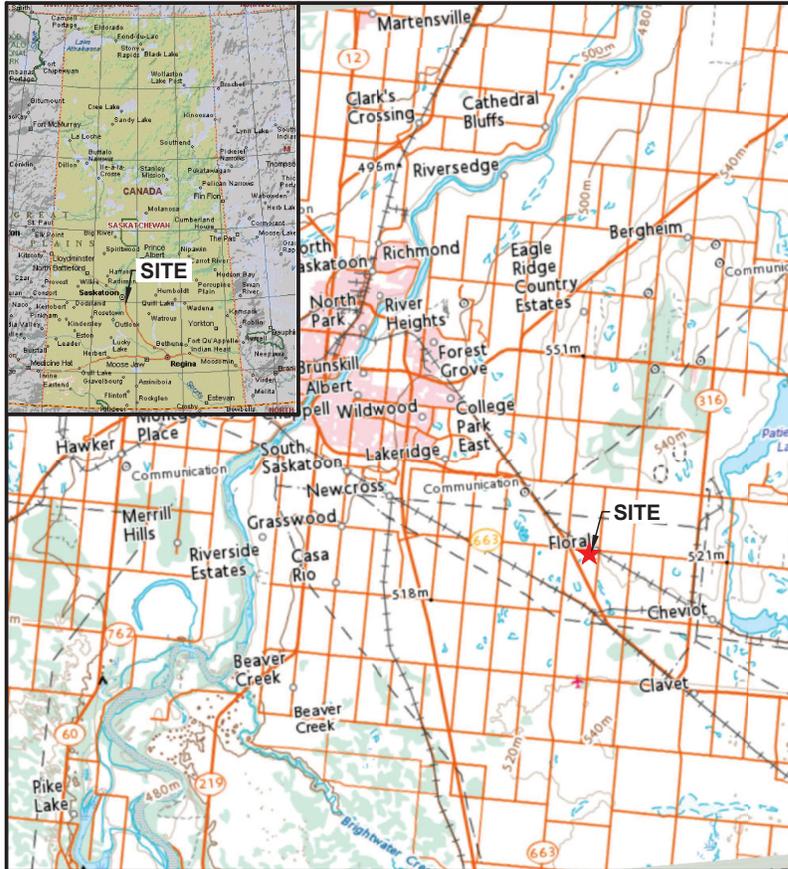


Date: 17 March 2022

H:\2) Projects\2880 Floral Subdivision Development CDR\2880 Geotech\Report\Final\2880 - Geotech Report - FINAL - 17Mar22.docx

# **Appendix A**

## **Figures**



**PINTER**  
LAND SERVICES LTD.

710A-48TH STREET EAST  
SASKATOON SK S7K 0S4  
306.24.1710  
pinterland@pinter.ca

- NOTES:**
1. IMAGE SOURCE FROM GOOGLE EARTH 2020  
IMAGE DATED 2015 (ACCESSED MARCH 2022).
  2. MAP FROM NATURAL RESOURCES CANADA  
GEOGRATIS.
  3. THIS DRAWING IS PREPARED FOR ILLUSTRATIVE  
PURPOSES ONLY.

**LEGEND**

SITE - APPROXIMATE LOCATION

★

**FIGURE 1**  
SITE LOCATION

11 MARCH 2022  
2800 - FLORAL INDUSTRIAL SUBDIVISION  
RM OF CORMAN PARK, SK.

DRAWN BY: NA  
CHECKED BY: KM

NOT TO SCALE

FILE: P101PROJECTS/2800 FLORAL SUBDIVISION DEVELOPMENT COR  
0800 DRAWINGS




**PINTER**  
 A SASKPOWER LTD  
 710A-46TH STREET EAST  
 SASKATOON SK S7K 0S4  
 306.244.1710  
 pintermain@pinter.ca

**NOTES:**

1. IMAGE SOURCE FROM GOOGLE EARTH 2022 (ACCESSED MARCH 2022).
2. THIS DRAWING IS PREPARED FOR ILLUSTRATIVE PURPOSES ONLY.
3. THIS IS NOT A LEGAL SURVEY.

**LEGEND**

TEST HOLE - APPROXIMATE LOCATION 

**FIGURE 2**  
**SITE LAYOUT**

11 MARCH 2022  
 280 - FLORAL INDUSTRIAL SUBDIVISION  
 RM OF CORMAN PARK, SK.

NOT TO SCALE

FILE: P101/PROJECT/280-FLORAL SUBDIVISION DEVELOPMENT COR  
0888 DRAWINGS

DRAWN BY: NA  
 CHECKED BY: KM

## **Appendix B**

### **Glossary of Terms & Abbreviations**

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## GLOSSARY OF TERMS AND ABBREVIATIONS

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Atterberg Limits	Values of water content which define when a soil acts non-plastically, plastically, and like a liquid
Borehole	A vertical hole drilled into the ground for the purposes of soil investigation and sample collection
CFEM	Canadian Foundation Engineering Manual
the Client	Sherwood Co-op.
cm	centimetres (1 cm = 0.01 m)
Cohesive Soils	Soils which possess a component of shear strength independent of interparticle friction (silts and clays)
End Bearing Capacity	The stress that can be supported by a unit area of pile due to transfer of load between the pile toe and the soil beneath it
$f_s$	Sleeve friction - The friction measured along the sides of the instrument during a CPTu test
Grain Size Analysis	The distribution of soil particle sizes within a soil sample
kPa	kilopascals (1 kPa = 20.9 lb/ft <sup>2</sup> )
Liquid Limit	The minimum water content at which a fine-grained soil behaves like a liquid
m	metres (1 m = 3.3 feet)
mm	millimetres (1 mm = 0.001 m)
m bgs	metres below ground surface
MPa	Megapascals (1 Mpa = 1000 kPa)
Moisture Content	The ratio of water to soil particles, by weight, in a soil sample
Non-cohesive soils	Soils which derive their shear strength entirely from interparticle friction (sands and gravels)

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Piezometer	An instrument for measuring the pressure or depth of groundwater
PINTER	PINTER & Associates Ltd.
Plasticity Index	The magnitude of the range of water contents over which a soil acts plastically
Plastic Limit	The minimum water content at which a fine-grained soil behaves plastically
Pocket Penetrometer	Instrument used to estimate the unconfined compressive strength of cohesive soils in the field
PVC	Polyvinyl Chloride - A synthetic plastic polymer
Shaft Resistance	The stress that can be supported by a unit area of pile due to friction between the soil and the outer surface of the pile
Shelby Tube	A 76 mm outer diameter, 762 mm long, thin-walled tube with a cutting edge for collecting undisturbed soil samples.
SPTs	Standard Penetration Tests
Unconfined Compressive Strength	The applied stress at which a cohesive soil sample fails with no confining pressure applied
Undisturbed sample	A soil sample collected in such a manner as to leave it completely intact, representing as closely as possible the conditions and properties of the soil in its natural state
Undrained shear strength	The shear stress at which a cohesive soil fails when the soil is loaded at a rate which does not allow internal pore water pressures to dissipate
Weeping Tile	A perforated pipe, surrounded by coarse aggregate, for collecting and redirecting groundwater

## **Appendix C**

### **Borehole Logs**









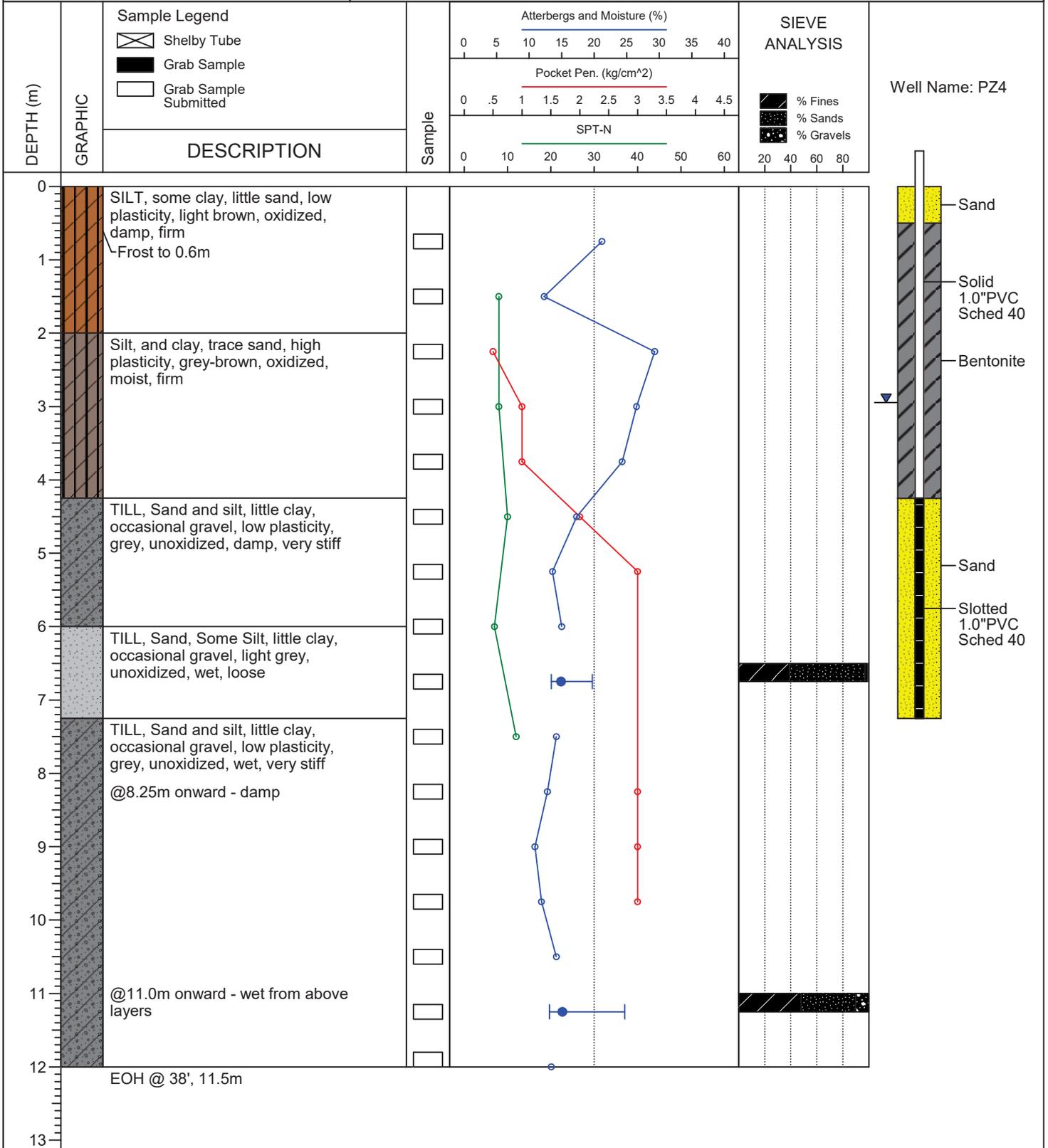
# LOG OF BORING BH4

(Page 1 of 1)

2880 Geotechnical Investigation  
Floral Subdivision CDR  
RM of Corman Park, SK  
Geotechnical Investigation

Drilling Method : Solid Stem Auger  
Date Finished : 16 February 2022  
Time Started : 16:00  
Logged By : EJ  
Checked By : KM

Surface Conditions : Snow, grass  
Wat. Elev. Recorded : 08Mar22  
Time Ended : 17:45  
Northing : 5768298 m  
Easting : 399397 m



03-10-2022 H:\2 Projects\2880 Floral Subdivision Development CDR\2880 BH Logs\QuikLogs\2880 - BH4.BH Log 10Mar22 EJ\_km.bo

**Appendix D**  
**Laboratory Analytical Reports**



## CERTIFICATE OF ANALYSIS

Work Order	: SK2200842	Page	: 1 of 21
Client	: PINTER & Associates Ltd.	Laboratory	: Saskatoon - Environmental
Contact	: Remi Valois	Account Manager	: Kimberley Head
Address	: 710A 48 Street East Saskatoon SK Canada S7K 5B4	Address	: 819 58 Street East Saskatoon SK Canada S7K 6X5
Telephone	: 306 244 1710	Telephone	: +1 306 668 8370
Project	: 2880	Date Samples Received	: 25-Feb-2022 16:45
PO	: ----	Date Analysis	: 28-Feb-2022
		Commenced	
C-O-C number	: ----	Issue Date	: 04-Mar-2022 10:53
Sampler	: ----		
Site	: ----		
Quote number	: 2022 Standard Rates		
No. of samples received	: 64		
No. of samples analysed	: 64		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

### Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Hedy Lai	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Ivan Yip	Laboratory Analyst	Organics, Saskatoon, Saskatchewan
Justin Kuzek	Team Leader - Organics	Organics, Saskatoon, Saskatchewan
Ping Yeung	Team Leader - Inorganics	Inorganics, Edmonton, Alberta



## General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances  
LOR: Limit of Reporting (detection limit).

<i>Unit</i>	<i>Description</i>
-	No Unit
%	percent

>: greater than.

<: less than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.



### Analytical Results

SK2200842-001

Sub-Matrix: **Soil**

(Matrix: **Soil/Solid**)

Client sample ID: BH1-1

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	26.1	± 2.12	0.25	%	E144	-	28-Feb-2022	419862

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Analytical Results

SK2200842-002

Sub-Matrix: **Soil**

(Matrix: **Soil/Solid**)

Client sample ID: BH1-2

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	17.4	± 1.42	0.25	%	E144	-	28-Feb-2022	419862

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Analytical Results

SK2200842-003

Sub-Matrix: **Soil**

(Matrix: **Soil/Solid**)

Client sample ID: BH1-3

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	17.4	± 1.42	0.25	%	E144	-	28-Feb-2022	419862

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Analytical Results

SK2200842-004

Sub-Matrix: **Soil**

(Matrix: **Soil/Solid**)

Client sample ID: BH1-4

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	21.9	± 1.78	0.25	%	E144	-	28-Feb-2022	419862

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Analytical Results

SK2200842-005

Sub-Matrix: **Soil**

(Matrix: **Soil/Solid**)

Client sample ID: BH1-5

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									



### Analytical Results

SK2200842-005

Sub-Matrix: **Soil**  
 (Matrix: **Soil/Solid**)

Client sample ID: BH1-5

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	22.2	± 1.81	0.25	%	E144	-	28-Feb-2022	419862

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Analytical Results

SK2200842-006

Sub-Matrix: **Soil**  
 (Matrix: **Soil/Solid**)

Client sample ID: BH1-6

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	22.3	± 1.81	0.25	%	E144	-	28-Feb-2022	419862

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Analytical Results

SK2200842-007

Sub-Matrix: **Soil**  
 (Matrix: **Soil/Solid**)

Client sample ID: BH1-7

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	18.6	± 1.52	0.25	%	E144	-	28-Feb-2022	419862

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Analytical Results

SK2200842-008

Sub-Matrix: **Soil**  
 (Matrix: **Soil/Solid**)

Client sample ID: BH1-8

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	11.4	± 0.94	0.25	%	E144	-	28-Feb-2022	419862

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Analytical Results

SK2200842-009

Sub-Matrix: **Soil**  
 (Matrix: **Soil/Solid**)

Client sample ID: BH1-9

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									



## Analytical Results

SK2200842-009

Sub-Matrix: Soil

(Matrix: Soil/Solid)

Client sample ID: BH1-9

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
Atterberg plastic limit [PL] (moisture)	----	14.9	± 1.8	1.0	%	E199	-	28-Feb-2022	419641
moisture	----	11.3	± 0.93	0.25	%	E144	-	28-Feb-2022	419862
Atterberg liquid limit [LL] (moisture)	----	29.1	± 1.9	1.0	%	E199	-	28-Feb-2022	419641
Atterberg plasticity index [PI]	----	14.2	-	1.0	%	E199	-	28-Feb-2022	419641
<b>Particle Size</b>									
passing (9.5 mm)	----	96.6	-	1.0	%	E181	28-Feb-2022	28-Feb-2022	419873
passing (4.75 mm)	----	93.7	-	1.0	%	E181	28-Feb-2022	28-Feb-2022	419873
passing (19 mm)	----	98.5	-	1.0	%	E181	28-Feb-2022	28-Feb-2022	419873
passing (25.4 mm)	----	100	-	1.0	%	E181	28-Feb-2022	28-Feb-2022	419873
passing (38.1 mm)	----	100	-	1.0	%	E181	28-Feb-2022	28-Feb-2022	419873
passing (50.8 mm)	----	100	-	1.0	%	E181	28-Feb-2022	28-Feb-2022	419873
passing (76.2 mm)	----	100	-	1.0	%	E181	28-Feb-2022	28-Feb-2022	419873
passing (1.0 mm)	----	83.8	± 3.6	1.0	%	E182	28-Feb-2022	28-Feb-2022	419874
passing (0.841 mm)	----	82.4	± 3.4	1.0	%	E182	28-Feb-2022	28-Feb-2022	419874
passing (0.50 mm)	----	78.2	± 3.2	1.0	%	E182	28-Feb-2022	28-Feb-2022	419874
passing (0.420 mm)	----	75.6	± 3.7	1.0	%	E182	28-Feb-2022	28-Feb-2022	419874
passing (0.250 mm)	----	68.9	± 3.2	1.0	%	E182	28-Feb-2022	28-Feb-2022	419874
passing (0.149 mm)	----	60.5	± 3.3	1.0	%	E182	28-Feb-2022	28-Feb-2022	419874
passing (0.125 mm)	----	57.6	± 2.8	1.0	%	E182	28-Feb-2022	28-Feb-2022	419874
passing (0.075 mm)	----	51.0	± 2.3	1.0	%	E182	28-Feb-2022	28-Feb-2022	419874
passing (0.063 mm)	----	49.5	± 2.8	1.0	%	E182	28-Feb-2022	28-Feb-2022	419874
passing (0.05 mm)	----	47.8	± 2.3	1.0	%	E182	28-Feb-2022	28-Feb-2022	419874
passing (0.0312 mm)	----	37.9	± 2.1	1.0	%	E184	28-Feb-2022	28-Feb-2022	419875
passing (0.020 mm)	----	33.6	± 2.0	1.0	%	E184	28-Feb-2022	28-Feb-2022	419875
passing (0.005 mm)	----	19.0	± 2.5	1.0	%	E184	28-Feb-2022	28-Feb-2022	419875
passing (0.004 mm)	----	17.9	± 2.2	1.0	%	E184	28-Feb-2022	28-Feb-2022	419875
passing (0.002 mm)	----	15.5	± 2.2	1.0	%	E184	28-Feb-2022	28-Feb-2022	419875
grain size curve	----	See Attached	-	-	-	E185A	-	03-Mar-2022	-
passing (2.0 mm)	----	87.8	-	1.0	%	E181	28-Feb-2022	28-Feb-2022	419873
<b>Inorganic Parameters</b>									
sulfate, total, ion content	14808-79-8	1.94	± 0.6	0.050	%	E246.SO4	02-Mar-2022	02-Mar-2022	421524

Please refer to the General Comments section for an explanation of any qualifiers detected.

## Analytical Results

SK2200842-010

Sub-Matrix: Soil

(Matrix: Soil/Solid)

Client sample ID: BH1-10

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	13.2	± 1.08	0.25	%	E144	-	28-Feb-2022	419862

Please refer to the General Comments section for an explanation of any qualifiers detected.



### Analytical Results

SK2200842-011

Sub-Matrix: **Soil**  
 (Matrix: **Soil/Solid**)

Client sample ID: BH1-11

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	11.4	± 0.94	0.25	%	E144	-	28-Feb-2022	419862

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Analytical Results

SK2200842-012

Sub-Matrix: **Soil**  
 (Matrix: **Soil/Solid**)

Client sample ID: BH1-12

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	12.1	± 1.00	0.25	%	E144	-	28-Feb-2022	419862

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Analytical Results

SK2200842-013

Sub-Matrix: **Soil**  
 (Matrix: **Soil/Solid**)

Client sample ID: BH1-13

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	11.2	± 0.92	0.25	%	E144	-	28-Feb-2022	419862

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Analytical Results

SK2200842-014

Sub-Matrix: **Soil**  
 (Matrix: **Soil/Solid**)

Client sample ID: BH1-14

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	9.67	± 0.80	0.25	%	E144	-	28-Feb-2022	419862

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Analytical Results

SK2200842-015

Sub-Matrix: **Soil**  
 (Matrix: **Soil/Solid**)

Client sample ID: BH2-1

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									



### Analytical Results

SK2200842-015

Sub-Matrix: Soil  
 (Matrix: Soil/Solid)

Client sample ID: BH2-1

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	23.0	± 1.87	0.25	%	E144	-	28-Feb-2022	419862

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Analytical Results

SK2200842-016

Sub-Matrix: Soil  
 (Matrix: Soil/Solid)

Client sample ID: BH2-2

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	23.8	± 1.93	0.25	%	E144	-	28-Feb-2022	419862

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Analytical Results

SK2200842-017

Sub-Matrix: Soil  
 (Matrix: Soil/Solid)

Client sample ID: BH2-3

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
Atterberg plastic limit [PL] (moisture)	----	26.3	± 3.1	1.0	%	E199	-	28-Feb-2022	419641
moisture	----	27.4	± 2.22	0.25	%	E144	-	28-Feb-2022	419862
Atterberg liquid limit [LL] (moisture)	----	56.9	± 3.8	1.0	%	E199	-	28-Feb-2022	419641
Atterberg plasticity index [PI]	----	30.6	-	1.0	%	E199	-	28-Feb-2022	419641
<b>Particle Size</b>									
passing (9.5 mm)	----	100	-	1.0	%	E181	28-Feb-2022	28-Feb-2022	419873
passing (4.75 mm)	----	100	-	1.0	%	E181	28-Feb-2022	28-Feb-2022	419873
passing (19 mm)	----	100	-	1.0	%	E181	28-Feb-2022	28-Feb-2022	419873
passing (25.4 mm)	----	100	-	1.0	%	E181	28-Feb-2022	28-Feb-2022	419873
passing (38.1 mm)	----	100	-	1.0	%	E181	28-Feb-2022	28-Feb-2022	419873
passing (50.8 mm)	----	100	-	1.0	%	E181	28-Feb-2022	28-Feb-2022	419873
passing (76.2 mm)	----	100	-	1.0	%	E181	28-Feb-2022	28-Feb-2022	419873
passing (1.0 mm)	----	100	± 3.6	1.0	%	E182	28-Feb-2022	28-Feb-2022	419874
passing (0.841 mm)	----	99.9	± 3.4	1.0	%	E182	28-Feb-2022	28-Feb-2022	419874
passing (0.50 mm)	----	99.7	± 3.2	1.0	%	E182	28-Feb-2022	28-Feb-2022	419874
passing (0.420 mm)	----	99.7	± 3.7	1.0	%	E182	28-Feb-2022	28-Feb-2022	419874
passing (0.250 mm)	----	99.5	± 3.2	1.0	%	E182	28-Feb-2022	28-Feb-2022	419874
passing (0.149 mm)	----	99.4	± 3.3	1.0	%	E182	28-Feb-2022	28-Feb-2022	419874
passing (0.125 mm)	----	99.3	± 2.8	1.0	%	E182	28-Feb-2022	28-Feb-2022	419874
passing (0.075 mm)	----	99.1	± 2.3	1.0	%	E182	28-Feb-2022	28-Feb-2022	419874
passing (0.063 mm)	----	99.0	± 2.8	1.0	%	E182	28-Feb-2022	28-Feb-2022	419874
passing (0.05 mm)	----	99.0	± 2.3	1.0	%	E182	28-Feb-2022	28-Feb-2022	419874
passing (0.0312 mm)	----	83.2	± 2.1	1.0	%	E184	28-Feb-2022	28-Feb-2022	419875
passing (0.020 mm)	----	74.1	± 2.0	1.0	%	E184	28-Feb-2022	28-Feb-2022	419875
passing (0.005 mm)	----	44.2	± 2.5	1.0	%	E184	28-Feb-2022	28-Feb-2022	419875



## Analytical Results

SK2200842-017

Sub-Matrix: Soil

(Matrix: Soil/Solid)

Client sample ID: BH2-3

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Particle Size</b>									
passing (0.004 mm)	----	41.2	± 2.2	1.0	%	E184	28-Feb-2022	28-Feb-2022	419875
passing (0.002 mm)	----	35.3	± 2.2	1.0	%	E184	28-Feb-2022	28-Feb-2022	419875
grain size curve	----	See Attached	-	-	-	E185A	-	03-Mar-2022	-
passing (2.0 mm)	----	100	-	1.0	%	E181	28-Feb-2022	28-Feb-2022	419873
<b>Inorganic Parameters</b>									
sulfate, total, ion content	14808-79-8	1.49	± 0.4	0.050	%	E246.SO4	02-Mar-2022	02-Mar-2022	421524

Please refer to the General Comments section for an explanation of any qualifiers detected.

## Analytical Results

SK2200842-018

Sub-Matrix: Soil

(Matrix: Soil/Solid)

Client sample ID: BH2-4

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	28.6	± 2.32	0.25	%	E144	-	28-Feb-2022	419862

Please refer to the General Comments section for an explanation of any qualifiers detected.

## Analytical Results

SK2200842-019

Sub-Matrix: Soil

(Matrix: Soil/Solid)

Client sample ID: BH2-5

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	24.9	± 2.02	0.25	%	E144	-	28-Feb-2022	419862

Please refer to the General Comments section for an explanation of any qualifiers detected.

## Analytical Results

SK2200842-020

Sub-Matrix: Soil

(Matrix: Soil/Solid)

Client sample ID: BH2-6

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	25.8	± 2.09	0.25	%	E144	-	28-Feb-2022	419862

Please refer to the General Comments section for an explanation of any qualifiers detected.



### Analytical Results

SK2200842-021

Sub-Matrix: **Soil**  
 (Matrix: **Soil/Solid**)

Client sample ID: BH2-7

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	24.5	± 1.99	0.25	%	E144	-	28-Feb-2022	419863

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Analytical Results

SK2200842-022

Sub-Matrix: **Soil**  
 (Matrix: **Soil/Solid**)

Client sample ID: BH2-8

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	24.3	± 1.97	0.25	%	E144	-	28-Feb-2022	419863

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Analytical Results

SK2200842-023

Sub-Matrix: **Soil**  
 (Matrix: **Soil/Solid**)

Client sample ID: BH2-9

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	29.1	± 2.36	0.25	%	E144	-	28-Feb-2022	419863

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Analytical Results

SK2200842-024

Sub-Matrix: **Soil**  
 (Matrix: **Soil/Solid**)

Client sample ID: BH2-10

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	19.0	± 1.55	0.25	%	E144	-	28-Feb-2022	419863

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Analytical Results

SK2200842-025

Sub-Matrix: **Soil**  
 (Matrix: **Soil/Solid**)

Client sample ID: BH2-11

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									



### Analytical Results

SK2200842-025

Sub-Matrix: **Soil**

(Matrix: **Soil/Solid**)

Client sample ID: BH2-11

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	12.0	± 0.99	0.25	%	E144	-	28-Feb-2022	419863

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Analytical Results

SK2200842-026

Sub-Matrix: **Soil**

(Matrix: **Soil/Solid**)

Client sample ID: BH2-12

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	12.2	± 1.00	0.25	%	E144	-	28-Feb-2022	419863

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Analytical Results

SK2200842-027

Sub-Matrix: **Soil**

(Matrix: **Soil/Solid**)

Client sample ID: BH2-13

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	11.7	± 0.97	0.25	%	E144	-	28-Feb-2022	419863

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Analytical Results

SK2200842-028

Sub-Matrix: **Soil**

(Matrix: **Soil/Solid**)

Client sample ID: BH2-14

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	12.7	± 1.05	0.25	%	E144	-	28-Feb-2022	419863

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Analytical Results

SK2200842-029

Sub-Matrix: **Soil**

(Matrix: **Soil/Solid**)

Client sample ID: BH2-15

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									



### Analytical Results

SK2200842-029

Sub-Matrix: **Soil**  
 (Matrix: **Soil/Solid**)

Client sample ID: BH2-15

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	12.4	± 1.02	0.25	%	E144	-	28-Feb-2022	419863

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Analytical Results

SK2200842-030

Sub-Matrix: **Soil**  
 (Matrix: **Soil/Solid**)

Client sample ID: BH2-16

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	12.2	± 1.01	0.25	%	E144	-	28-Feb-2022	419863

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Analytical Results

SK2200842-031

Sub-Matrix: **Soil**  
 (Matrix: **Soil/Solid**)

Client sample ID: BH3-1

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	24.2	± 1.96	0.25	%	E144	-	28-Feb-2022	419863

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Analytical Results

SK2200842-032

Sub-Matrix: **Soil**  
 (Matrix: **Soil/Solid**)

Client sample ID: BH3-2

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
Atterberg plastic limit [PL] (moisture)	----	20.8	± 2.4	1.0	%	E199	-	28-Feb-2022	419641
moisture	----	21.5	± 1.75	0.25	%	E144	-	28-Feb-2022	419863
Atterberg liquid limit [LL] (moisture)	----	42.3	± 2.8	1.0	%	E199	-	28-Feb-2022	419641
Atterberg plasticity index [PI]	----	21.5	-	1.0	%	E199	-	28-Feb-2022	419641
<b>Particle Size</b>									
passing (9.5 mm)	----	100	-	1.0	%	E181	28-Feb-2022	28-Feb-2022	419873
passing (4.75 mm)	----	100	-	1.0	%	E181	28-Feb-2022	28-Feb-2022	419873
passing (19 mm)	----	100	-	1.0	%	E181	28-Feb-2022	28-Feb-2022	419873
passing (25.4 mm)	----	100	-	1.0	%	E181	28-Feb-2022	28-Feb-2022	419873
passing (38.1 mm)	----	100	-	1.0	%	E181	28-Feb-2022	28-Feb-2022	419873
passing (50.8 mm)	----	100	-	1.0	%	E181	28-Feb-2022	28-Feb-2022	419873
passing (76.2 mm)	----	100	-	1.0	%	E181	28-Feb-2022	28-Feb-2022	419873



## Analytical Results

SK2200842-032

Sub-Matrix: Soil

(Matrix: Soil/Solid)

Client sample ID: BH3-2

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Particle Size</b>									
passing (1.0 mm)	----	100	± 3.6	1.0	%	E182	28-Feb-2022	28-Feb-2022	419874
passing (0.841 mm)	----	100	± 3.4	1.0	%	E182	28-Feb-2022	28-Feb-2022	419874
passing (0.50 mm)	----	99.8	± 3.2	1.0	%	E182	28-Feb-2022	28-Feb-2022	419874
passing (0.420 mm)	----	99.8	± 3.7	1.0	%	E182	28-Feb-2022	28-Feb-2022	419874
passing (0.250 mm)	----	99.7	± 3.2	1.0	%	E182	28-Feb-2022	28-Feb-2022	419874
passing (0.149 mm)	----	99.4	± 3.3	1.0	%	E182	28-Feb-2022	28-Feb-2022	419874
passing (0.125 mm)	----	99.3	± 2.8	1.0	%	E182	28-Feb-2022	28-Feb-2022	419874
passing (0.075 mm)	----	84.5	± 2.3	1.0	%	E182	28-Feb-2022	28-Feb-2022	419874
passing (0.063 mm)	----	81.0	± 2.8	1.0	%	E182	28-Feb-2022	28-Feb-2022	419874
passing (0.05 mm)	----	77.2	± 2.3	1.0	%	E182	28-Feb-2022	28-Feb-2022	419874
passing (0.0312 mm)	----	55.4	± 2.1	1.0	%	E184	28-Feb-2022	28-Feb-2022	419875
passing (0.020 mm)	----	49.0	± 2.0	1.0	%	E184	28-Feb-2022	28-Feb-2022	419875
passing (0.005 mm)	----	26.5	± 2.5	1.0	%	E184	28-Feb-2022	28-Feb-2022	419875
passing (0.004 mm)	----	25.5	± 2.2	1.0	%	E184	28-Feb-2022	28-Feb-2022	419875
passing (0.002 mm)	----	23.5	± 2.2	1.0	%	E184	28-Feb-2022	28-Feb-2022	419875
grain size curve	----	See Attached	-	-	-	E185A	-	03-Mar-2022	-
passing (2.0 mm)	----	100	-	1.0	%	E181	28-Feb-2022	28-Feb-2022	419873

Please refer to the General Comments section for an explanation of any qualifiers detected.

## Analytical Results

SK2200842-033

Sub-Matrix: Soil

(Matrix: Soil/Solid)

Client sample ID: BH3-3

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	24.7	± 2.00	0.25	%	E144	-	28-Feb-2022	419863

Please refer to the General Comments section for an explanation of any qualifiers detected.

## Analytical Results

SK2200842-034

Sub-Matrix: Soil

(Matrix: Soil/Solid)

Client sample ID: BH3-4

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	24.3	± 1.97	0.25	%	E144	-	28-Feb-2022	419863

Please refer to the General Comments section for an explanation of any qualifiers detected.



### Analytical Results

SK2200842-035

Sub-Matrix: **Soil**  
 (Matrix: **Soil/Solid**)

Client sample ID: BH3-5

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	16.6	± 1.36	0.25	%	E144	-	28-Feb-2022	419863

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Analytical Results

SK2200842-036

Sub-Matrix: **Soil**  
 (Matrix: **Soil/Solid**)

Client sample ID: BH3-6

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	22.1	± 1.80	0.25	%	E144	-	28-Feb-2022	419863

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Analytical Results

SK2200842-037

Sub-Matrix: **Soil**  
 (Matrix: **Soil/Solid**)

Client sample ID: BH3-7

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	10.9	± 0.90	0.25	%	E144	-	28-Feb-2022	419863

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Analytical Results

SK2200842-038

Sub-Matrix: **Soil**  
 (Matrix: **Soil/Solid**)

Client sample ID: BH3-8

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	11.3	± 0.94	0.25	%	E144	-	28-Feb-2022	419863

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Analytical Results

SK2200842-039

Sub-Matrix: **Soil**  
 (Matrix: **Soil/Solid**)

Client sample ID: BH3-9

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									



### Analytical Results

SK2200842-039

Sub-Matrix: **Soil**  
 (Matrix: **Soil/Solid**)

Client sample ID: BH3-9

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	11.2	± 0.93	0.25	%	E144	-	28-Feb-2022	419863

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Analytical Results

SK2200842-040

Sub-Matrix: **Soil**  
 (Matrix: **Soil/Solid**)

Client sample ID: BH3-10

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	11.1	± 0.92	0.25	%	E144	-	28-Feb-2022	419863

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Analytical Results

SK2200842-041

Sub-Matrix: **Soil**  
 (Matrix: **Soil/Solid**)

Client sample ID: BH3-11

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	11.5	± 0.95	0.25	%	E144	-	28-Feb-2022	419864

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Analytical Results

SK2200842-042

Sub-Matrix: **Soil**  
 (Matrix: **Soil/Solid**)

Client sample ID: BH3-12

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	11.6	± 0.96	0.25	%	E144	-	28-Feb-2022	419864

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Analytical Results

SK2200842-043

Sub-Matrix: **Soil**  
 (Matrix: **Soil/Solid**)

Client sample ID: BH3-13

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									



### Analytical Results

SK2200842-043

Sub-Matrix: **Soil**

(Matrix: **Soil/Solid**)

Client sample ID: BH3-13

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	10.1	± 0.84	0.25	%	E144	-	28-Feb-2022	419864

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Analytical Results

SK2200842-044

Sub-Matrix: **Soil**

(Matrix: **Soil/Solid**)

Client sample ID: BH3-14

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	10.7	± 0.88	0.25	%	E144	-	28-Feb-2022	419864

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Analytical Results

SK2200842-045

Sub-Matrix: **Soil**

(Matrix: **Soil/Solid**)

Client sample ID: BH3-15

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	12.6	± 1.04	0.25	%	E144	-	28-Feb-2022	419864

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Analytical Results

SK2200842-046

Sub-Matrix: **Soil**

(Matrix: **Soil/Solid**)

Client sample ID: BH3-16

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	11.6	± 0.96	0.25	%	E144	-	28-Feb-2022	419864

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Analytical Results

SK2200842-047

Sub-Matrix: **Soil**

(Matrix: **Soil/Solid**)

Client sample ID: BH4-1

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									



### Analytical Results

SK2200842-047

Sub-Matrix: **Soil**

(Matrix: **Soil/Solid**)

Client sample ID: BH4-1

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	21.2	± 1.72	0.25	%	E144	-	28-Feb-2022	419864

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Analytical Results

SK2200842-048

Sub-Matrix: **Soil**

(Matrix: **Soil/Solid**)

Client sample ID: BH4-2

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	12.3	± 1.01	0.25	%	E144	-	28-Feb-2022	419864

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Analytical Results

SK2200842-049

Sub-Matrix: **Soil**

(Matrix: **Soil/Solid**)

Client sample ID: BH4-3

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	29.3	± 2.37	0.25	%	E144	-	28-Feb-2022	419864

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Analytical Results

SK2200842-050

Sub-Matrix: **Soil**

(Matrix: **Soil/Solid**)

Client sample ID: BH4-4

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	26.5	± 2.15	0.25	%	E144	-	28-Feb-2022	419864

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Analytical Results

SK2200842-051

Sub-Matrix: **Soil**

(Matrix: **Soil/Solid**)

Client sample ID: BH4-5

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									



### Analytical Results

SK2200842-051

Sub-Matrix: **Soil**

(Matrix: **Soil/Solid**)

Client sample ID: BH4-5

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	24.3	± 1.97	0.25	%	E144	-	28-Feb-2022	419864

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Analytical Results

SK2200842-052

Sub-Matrix: **Soil**

(Matrix: **Soil/Solid**)

Client sample ID: BH4-6

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	17.3	± 1.42	0.25	%	E144	-	28-Feb-2022	419864

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Analytical Results

SK2200842-053

Sub-Matrix: **Soil**

(Matrix: **Soil/Solid**)

Client sample ID: BH4-7

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	13.6	± 1.12	0.25	%	E144	-	28-Feb-2022	419864

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Analytical Results

SK2200842-054

Sub-Matrix: **Soil**

(Matrix: **Soil/Solid**)

Client sample ID: BH4-8

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	15.0	± 1.23	0.25	%	E144	-	28-Feb-2022	419864

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Analytical Results

SK2200842-055

Sub-Matrix: **Soil**

(Matrix: **Soil/Solid**)

Client sample ID: BH4-9

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									



## Analytical Results

SK2200842-055

Sub-Matrix: Soil

(Matrix: Soil/Solid)

Client sample ID: BH4-9

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
Atterberg plastic limit [PL] (moisture)	----	13.4	± 1.6	1.0	%	E199	-	28-Feb-2022	419641
moisture	----	14.9	± 1.22	0.25	%	E144	-	28-Feb-2022	419864
Atterberg liquid limit [LL] (moisture)	----	19.7	± 1.3	1.0	%	E199	-	28-Feb-2022	419641
Atterberg plasticity index [PI]	----	6.3	-	1.0	%	E199	-	28-Feb-2022	419641
<b>Particle Size</b>									
passing (9.5 mm)	----	98.4	-	1.0	%	E181	28-Feb-2022	28-Feb-2022	419873
passing (4.75 mm)	----	97.5	-	1.0	%	E181	28-Feb-2022	28-Feb-2022	419873
passing (19 mm)	----	99.9	-	1.0	%	E181	28-Feb-2022	28-Feb-2022	419873
passing (25.4 mm)	----	100	-	1.0	%	E181	28-Feb-2022	28-Feb-2022	419873
passing (38.1 mm)	----	100	-	1.0	%	E181	28-Feb-2022	28-Feb-2022	419873
passing (50.8 mm)	----	100	-	1.0	%	E181	28-Feb-2022	28-Feb-2022	419873
passing (76.2 mm)	----	100	-	1.0	%	E181	28-Feb-2022	28-Feb-2022	419873
passing (1.0 mm)	----	92.3	± 3.6	1.0	%	E182	28-Feb-2022	28-Feb-2022	419874
passing (0.841 mm)	----	89.2	± 3.4	1.0	%	E182	28-Feb-2022	28-Feb-2022	419874
passing (0.50 mm)	----	79.8	± 3.2	1.0	%	E182	28-Feb-2022	28-Feb-2022	419874
passing (0.420 mm)	----	74.6	± 3.7	1.0	%	E182	28-Feb-2022	28-Feb-2022	419874
passing (0.250 mm)	----	61.0	± 3.2	1.0	%	E182	28-Feb-2022	28-Feb-2022	419874
passing (0.149 mm)	----	50.5	± 3.3	1.0	%	E182	28-Feb-2022	28-Feb-2022	419874
passing (0.125 mm)	----	46.9	± 2.8	1.0	%	E182	28-Feb-2022	28-Feb-2022	419874
passing (0.075 mm)	----	39.2	± 2.3	1.0	%	E182	28-Feb-2022	28-Feb-2022	419874
passing (0.063 mm)	----	37.3	± 2.8	1.0	%	E182	28-Feb-2022	28-Feb-2022	419874
passing (0.05 mm)	----	35.3	± 2.3	1.0	%	E182	28-Feb-2022	28-Feb-2022	419874
passing (0.0312 mm)	----	26.8	± 2.1	1.0	%	E184	28-Feb-2022	28-Feb-2022	419875
passing (0.020 mm)	----	23.5	± 2.0	1.0	%	E184	28-Feb-2022	28-Feb-2022	419875
passing (0.005 mm)	----	12.5	± 2.5	1.0	%	E184	28-Feb-2022	28-Feb-2022	419875
passing (0.004 mm)	----	11.8	± 2.2	1.0	%	E184	28-Feb-2022	28-Feb-2022	419875
passing (0.002 mm)	----	10.3	± 2.2	1.0	%	E184	28-Feb-2022	28-Feb-2022	419875
grain size curve	----	See Attached	-	-	-	E185A	-	03-Mar-2022	-
passing (2.0 mm)	----	95.1	-	1.0	%	E181	28-Feb-2022	28-Feb-2022	419873

Please refer to the General Comments section for an explanation of any qualifiers detected.

## Analytical Results

SK2200842-056

Sub-Matrix: Soil

(Matrix: Soil/Solid)

Client sample ID: BH4-10

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	14.2	± 1.17	0.25	%	E144	-	28-Feb-2022	419864

Please refer to the General Comments section for an explanation of any qualifiers detected.

## Analytical Results

SK2200842-057

Sub-Matrix: Soil

(Matrix: Soil/Solid)

Client sample ID: BH4-11

Client sampling date / time: 25-Feb-2022 12:00



### Analytical Results

SK2200842-057

Sub-Matrix: **Soil**  
 (Matrix: **Soil/Solid**)

Client sample ID: BH4-11

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	12.8	± 1.05	0.25	%	E144	-	28-Feb-2022	419864

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Analytical Results

SK2200842-058

Sub-Matrix: **Soil**  
 (Matrix: **Soil/Solid**)

Client sample ID: BH4-12

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	10.9	± 0.90	0.25	%	E144	-	28-Feb-2022	419864

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Analytical Results

SK2200842-059

Sub-Matrix: **Soil**  
 (Matrix: **Soil/Solid**)

Client sample ID: BH4-13

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	11.9	± 0.98	0.25	%	E144	-	28-Feb-2022	419864

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Analytical Results

SK2200842-060

Sub-Matrix: **Soil**  
 (Matrix: **Soil/Solid**)

Client sample ID: BH4-14

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	14.2	± 1.16	0.25	%	E144	-	28-Feb-2022	419864

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Analytical Results

SK2200842-061

Sub-Matrix: **Soil**  
 (Matrix: **Soil/Solid**)

Client sample ID: BH4-15

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									



## Analytical Results

SK2200842-061

Sub-Matrix: Soil

(Matrix: Soil/Solid)

Client sample ID: BH4-15

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
Atterberg plastic limit [PL] (moisture)	----	13.1	± 1.5	1.0	%	E199	-	28-Feb-2022	419641
moisture	----	15.1	± 1.24	0.25	%	E144	-	03-Mar-2022	422767
Atterberg liquid limit [LL] (moisture)	----	24.7	± 1.6	1.0	%	E199	-	28-Feb-2022	419641
Atterberg plasticity index [PI]	----	11.6	-	1.0	%	E199	-	28-Feb-2022	419641
<b>Particle Size</b>									
passing (9.5 mm)	----	93.5	-	1.0	%	E181	28-Feb-2022	28-Feb-2022	419873
passing (4.75 mm)	----	89.8	-	1.0	%	E181	28-Feb-2022	28-Feb-2022	419873
passing (19 mm)	----	95.8	-	1.0	%	E181	28-Feb-2022	28-Feb-2022	419873
passing (25.4 mm)	----	96.7	-	1.0	%	E181	28-Feb-2022	28-Feb-2022	419873
passing (38.1 mm)	----	100	-	1.0	%	E181	28-Feb-2022	28-Feb-2022	419873
passing (50.8 mm)	----	100	-	1.0	%	E181	28-Feb-2022	28-Feb-2022	419873
passing (76.2 mm)	----	100	-	1.0	%	E181	28-Feb-2022	28-Feb-2022	419873
passing (1.0 mm)	----	79.4	± 3.6	1.0	%	E182	28-Feb-2022	28-Feb-2022	419874
passing (0.841 mm)	----	78.0	± 3.4	1.0	%	E182	28-Feb-2022	28-Feb-2022	419874
passing (0.50 mm)	----	73.9	± 3.2	1.0	%	E182	28-Feb-2022	28-Feb-2022	419874
passing (0.420 mm)	----	71.2	± 3.7	1.0	%	E182	28-Feb-2022	28-Feb-2022	419874
passing (0.250 mm)	----	64.0	± 3.2	1.0	%	E182	28-Feb-2022	28-Feb-2022	419874
passing (0.149 mm)	----	56.6	± 3.3	1.0	%	E182	28-Feb-2022	28-Feb-2022	419874
passing (0.125 mm)	----	54.1	± 2.8	1.0	%	E182	28-Feb-2022	28-Feb-2022	419874
passing (0.075 mm)	----	48.1	± 2.3	1.0	%	E182	28-Feb-2022	28-Feb-2022	419874
passing (0.063 mm)	----	46.6	± 2.8	1.0	%	E182	28-Feb-2022	28-Feb-2022	419874
passing (0.05 mm)	----	45.0	± 2.3	1.0	%	E182	28-Feb-2022	28-Feb-2022	419874
passing (0.0312 mm)	----	36.0	± 2.1	1.0	%	E184	28-Feb-2022	28-Feb-2022	419875
passing (0.020 mm)	----	31.9	± 2.0	1.0	%	E184	28-Feb-2022	28-Feb-2022	419875
passing (0.005 mm)	----	18.5	± 2.5	1.0	%	E184	28-Feb-2022	28-Feb-2022	419875
passing (0.004 mm)	----	17.4	± 2.2	1.0	%	E184	28-Feb-2022	28-Feb-2022	419875
passing (0.002 mm)	----	15.2	± 2.2	1.0	%	E184	28-Feb-2022	28-Feb-2022	419875
grain size curve	----	See Attached	-	-	-	E185A	-	03-Mar-2022	-
passing (2.0 mm)	----	84.1	-	1.0	%	E181	28-Feb-2022	28-Feb-2022	419873

Please refer to the General Comments section for an explanation of any qualifiers detected.

## Analytical Results

SK2200842-062

Sub-Matrix: Soil

(Matrix: Soil/Solid)

Client sample ID: BH4-16

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
moisture	----	13.4	± 1.10	0.25	%	E144	-	03-Mar-2022	422767

Please refer to the General Comments section for an explanation of any qualifiers detected.

## Analytical Results

SK2200842-063

Sub-Matrix: Soil

(Matrix: Soil/Solid)

Client sample ID: BH1-15

Client sampling date / time: 25-Feb-2022 12:00



### Analytical Results

SK2200842-063

Sub-Matrix: **Soil**

(Matrix: **Soil/Solid**)

Client sample ID: BH1-15

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
<b>moisture</b>	----	10.0	± 0.83	0.25	%	E144	-	03-Mar-2022	422767

Please refer to the General Comments section for an explanation of any qualifiers detected.

### Analytical Results

SK2200842-064

Sub-Matrix: **Soil**

(Matrix: **Soil/Solid**)

Client sample ID: BH1-16

Client sampling date / time: 25-Feb-2022 12:00

Analyte	CAS Number	Result	Measurement Uncertainty	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
<b>Physical Tests</b>									
<b>moisture</b>	----	9.86	± 0.82	0.25	%	E144	-	03-Mar-2022	422767

Please refer to the General Comments section for an explanation of any qualifiers detected.



## QUALITY CONTROL REPORT

<b>Work Order</b>	<b>: SK2200842</b>	<b>Page</b>	<b>: 1 of 6</b>
<b>Client</b>	: PINTER & Associates Ltd.	<b>Laboratory</b>	: Saskatoon - Environmental
<b>Contact</b>	: Remi Valois	<b>Account Manager</b>	: Kimberley Head
<b>Address</b>	: 710A 48 Street East Saskatoon SK Canada S7K 5B4	<b>Address</b>	: 819 58 Street East Saskatoon, Saskatchewan Canada S7K 6X5
<b>Telephone</b>	: 306 244 1710	<b>Telephone</b>	: +1 306 668 8370
<b>Project</b>	: 2880	<b>Date Samples Received</b>	: 25-Feb-2022 16:45
<b>PO</b>	: ----	<b>Date Analysis Commenced</b>	: 28-Feb-2022
<b>C-O-C number</b>	: ----	<b>Issue Date</b>	: 04-Mar-2022 10:53
<b>Sampler</b>	: ----		
<b>Site</b>	: ----		
<b>Quote number</b>	: 2022 Standard Rates		
<b>No. of samples received</b>	: 64		
<b>No. of samples analysed</b>	: 64		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits
- Reference Material (RM) Report; Recovery and Acceptance Limits
- Method Blank (MB) Report; Recovery and Acceptance Limits
- Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

### Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Hedy Lai	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Ivan Yip	Laboratory Analyst	Organics, Saskatoon, Saskatchewan
Justin Kuzek	Team Leader - Organics	Organics, Saskatoon, Saskatchewan
Ping Yeung	Team Leader - Inorganics	Inorganics, Edmonton, Alberta

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Work Order : SK2200842  
Client : PINTER & Associates Ltd.  
Project : 2880



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### **General Comments**

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number = Chemical Abstracts Services number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percentage Difference

# = Indicates a QC result that did not meet the ALS DQO.

### **Workorder Comments**

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Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

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### Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test specific).

Sub-Matrix: Soil/Solid					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
<b>Physical Tests (QC Lot: 419641)</b>											
SK2200842-009	BH1-9	Atterberg liquid limit [LL] (moisture)	----	E199	1.0	%	29.1	29.0	0.625%	20%	----
		Atterberg plastic limit [PL] (moisture)	----	E199	1.0	%	14.9	14.9	0.244%	20%	----
<b>Physical Tests (QC Lot: 419862)</b>											
SK2200842-001	BH1-1	moisture	----	E144	0.25	%	26.1	25.6	1.81%	20%	----
<b>Physical Tests (QC Lot: 419863)</b>											
SK2200842-021	BH2-7	moisture	----	E144	0.25	%	24.5	24.1	1.52%	20%	----
<b>Physical Tests (QC Lot: 419864)</b>											
SK2200842-041	BH3-11	moisture	----	E144	0.25	%	11.5	11.3	2.16%	20%	----
<b>Physical Tests (QC Lot: 422767)</b>											
SK2200842-061	BH4-15	moisture	----	E144	0.25	%	15.1	14.5	3.93%	20%	----
<b>Particle Size (QC Lot: 419874)</b>											
SK2200842-009	BH1-9	passing (0.05 mm)	----	E182	1.0	%	47.8	47.6	0.274%	15%	----
		passing (0.063 mm)	----	E182	1.0	%	49.5	49.4	0.0886%	15%	----
		passing (0.075 mm)	----	E182	1.0	%	51.0	51.1	0.0709%	15%	----
		passing (0.125 mm)	----	E182	1.0	%	57.6	58.0	0.640%	15%	----
		passing (0.149 mm)	----	E182	1.0	%	60.5	60.9	0.771%	15%	----
		passing (0.250 mm)	----	E182	1.0	%	68.9	69.6	1.09%	15%	----
		passing (0.420 mm)	----	E182	1.0	%	75.6	76.4	1.03%	15%	----
		passing (0.50 mm)	----	E182	1.0	%	78.2	79.0	1.01%	15%	----
		passing (0.841 mm)	----	E182	1.0	%	82.4	82.6	0.256%	15%	----
passing (1.0 mm)	----	E182	1.0	%	83.8	83.8	0.0204%	15%	----		
<b>Particle Size (QC Lot: 419875)</b>											
SK2200842-009	BH1-9	passing (0.002 mm)	----	E184	1.0	%	15.5	15.9	2.45%	15%	----
		passing (0.004 mm)	----	E184	1.0	%	17.9	18.0	0.879%	15%	----
		passing (0.005 mm)	----	E184	1.0	%	19.0	19.1	0.232%	15%	----
		passing (0.020 mm)	----	E184	1.0	%	33.6	33.2	1.08%	15%	----
		passing (0.0312 mm)	----	E184	1.0	%	37.9	37.4	1.34%	15%	----
<b>Inorganic Parameters (QC Lot: 421524)</b>											
SK2200842-009	BH1-9	sulfate, total, ion content	14808-79-8	E246.SO4	0.050	mg/kg	1.94 %	25600	27.7%	30%	----



### Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: Soil/Solid

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Physical Tests (QCLot: 419862)</b>						
moisture	---	E144	0.25	%	<0.25	---
<b>Physical Tests (QCLot: 419863)</b>						
moisture	---	E144	0.25	%	<0.25	---
<b>Physical Tests (QCLot: 419864)</b>						
moisture	---	E144	0.25	%	<0.25	---
<b>Physical Tests (QCLot: 422767)</b>						
moisture	---	E144	0.25	%	<0.25	---
<b>Inorganic Parameters (QCLot: 421524)</b>						
sulfate, total, ion content	14808-79-8	E246.S04	500	mg/kg	<500	---

### Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: Soil/Solid

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike Concentration	Recovery (%) LCS	Recovery Limits (%)		Qualifier
							Low	High	
<b>Physical Tests (QCLot: 419862)</b>									
moisture	---	E144	0.25	%	50 %	99.2	90.0	110	---
<b>Physical Tests (QCLot: 419863)</b>									
moisture	---	E144	0.25	%	50 %	99.0	90.0	110	---
<b>Physical Tests (QCLot: 419864)</b>									
moisture	---	E144	0.25	%	50 %	99.1	90.0	110	---
<b>Physical Tests (QCLot: 422767)</b>									
moisture	---	E144	0.25	%	50 %	99.4	90.0	110	---
<b>Inorganic Parameters (QCLot: 421524)</b>									
sulfate, total, ion content	14808-79-8	E246.S04	500	mg/kg	10000 mg/kg	104	70.0	130	---



## Reference Material (RM) Report

A Reference Material (RM) is a homogenous material with known and well-established analyte concentrations. RMs are processed in an identical manner to test samples, and are used to monitor and control the accuracy and precision of a test method for a typical sample matrix. RM results are expressed as percent recovery of the target analyte concentration. RM targets may be certified target concentrations provided by the RM supplier, or may be ALS long-term mean values (for empirical test methods).

Sub-Matrix: Soil/Solid

Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Reference Material (RM) Report				
					RM Target Concentration	Recovery (%) RM	Recovery Limits (%)		Qualifier
							Low	High	
<b>Physical Tests (QCLot: 419641)</b>									
QC-419641-001	RM	Atterberg liquid limit [LL] (moisture)	----	E199	33.68 %	99.2	80.0	120	----
QC-419641-001	RM	Atterberg plastic limit [PL] (moisture)	----	E199	20 %	102	80.0	120	----
<b>Particle Size (QCLot: 419873)</b>									
QC-419873-001	RM	passing (19 mm)	----	E181	100 %	100	90.0	110	----
QC-419873-001	RM	passing (2.0 mm)	----	E181	100 %	100	90.0	110	----
QC-419873-001	RM	passing (25.4 mm)	----	E181	100 %	100	90.0	110	----
QC-419873-001	RM	passing (38.1 mm)	----	E181	100 %	100	90.0	110	----
QC-419873-001	RM	passing (4.75 mm)	----	E181	100 %	100	90.0	110	----
QC-419873-001	RM	passing (50.8 mm)	----	E181	100 %	100	90.0	110	----
QC-419873-001	RM	passing (76.2 mm)	----	E181	100 %	100	90.0	110	----
QC-419873-001	RM	passing (9.5 mm)	----	E181	100 %	100	90.0	110	----
<b>Particle Size (QCLot: 419874)</b>									
QC-419874-001	RM	passing (0.05 mm)	----	E182	49.81 %	103	90.0	110	----
QC-419874-001	RM	passing (0.063 mm)	----	E182	54.27 %	99.6	90.8	109	----
QC-419874-001	RM	passing (0.075 mm)	----	E182	58.38 %	97.1	91.4	109	----
QC-419874-001	RM	passing (0.125 mm)	----	E182	68.06 %	99.3	92.7	107	----
QC-419874-001	RM	passing (0.149 mm)	----	E182	72.71 %	98.8	93.1	107	----
QC-419874-001	RM	passing (0.250 mm)	----	E182	85.38 %	98.8	94.1	106	----
QC-419874-001	RM	passing (0.420 mm)	----	E182	92.78 %	98.3	94.6	105	----
QC-419874-001	RM	passing (0.50 mm)	----	E182	93.78 %	100	94.7	105	----
QC-419874-001	RM	passing (0.841 mm)	----	E182	97.34 %	99.2	94.9	105	----
QC-419874-001	RM	passing (1.0 mm)	----	E182	97.77 %	99.7	94.9	105	----
<b>Particle Size (QCLot: 419875)</b>									
QC-419875-001	RM	passing (0.002 mm)	----	E184	19.34 %	98.0	74.1	126	----
QC-419875-001	RM	passing (0.004 mm)	----	E184	21.51 %	100	76.8	123	----
QC-419875-001	RM	passing (0.005 mm)	----	E184	22.6 %	101	77.9	122	----
QC-419875-001	RM	passing (0.020 mm)	----	E184	35.27 %	106	85.8	114	----
QC-419875-001	RM	passing (0.0312 mm)	----	E184	41.61 %	101	88.0	112	----
<b>Inorganic Parameters (QCLot: 421524)</b>									

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Sub-Matrix: Soil/Solid

					Reference Material (RM) Report				
Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	RM Target Concentration	Recovery (%) RM	Recovery Limits (%)		Qualifier
							Low	High	
<b>Inorganic Parameters (QCLot: 421524) - continued</b>									
QC-421524-003	RM	sulfate, total, ion content	14808-79-8	E246.SO4	33400 mg/kg	83.4	80.0	120	----



## QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: SK2200842	Page	: 1 of 16
Client	: PINTER & Associates Ltd.	Laboratory	: Saskatoon - Environmental
Contact	: Remi Valois	Account Manager	: Kimberley Head
Address	: 710A 48 Street East Saskatoon SK Canada S7K 5B4	Address	: 819 58 Street East Saskatoon, Saskatchewan Canada S7K 6X5
Telephone	: 306 244 1710	Telephone	: +1 306 668 8370
Project	: 2880	Date Samples Received	: 25-Feb-2022 16:45
PO	: ----	Issue Date	: 04-Mar-2022 10:53
C-O-C number	: ----		
Sampler	: ----		
Site	: ----		
Quote number	: 2022 Standard Rates		
No. of samples received	: 64		
No. of samples analysed	: 64		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

### Key

- Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
- CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances.
- DQO: Data Quality Objective.
- LOR: Limit of Reporting (detection limit).
- RPD: Relative Percent Difference.

### Workorder Comments

Holding times are displayed as "----" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

### Summary of Outliers

#### Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

#### Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

#### Outliers : Analysis Holding Time Compliance (Breaches)

- No Analysis Holding Time Outliers exist.

***Outliers : Frequency of Quality Control Samples***

- No Quality Control Sample Frequency Outliers occur.



## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and/or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Soil/Solid**

Evaluation: \* = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
Container / Client Sample ID(s)				Rec	Actual			Rec	Actual	
<b>Inorganic Parameters : Total Sulfate ion in soil by acidic boiling water extraction, IC</b>										
LDPE bag BH1-9	E246.S04	25-Feb-2022	02-Mar-2022	180 days	5 days	✓	02-Mar-2022	28 days	0 days	✓
<b>Inorganic Parameters : Total Sulfate ion in soil by acidic boiling water extraction, IC</b>										
LDPE bag BH2-3	E246.S04	25-Feb-2022	02-Mar-2022	180 days	5 days	✓	02-Mar-2022	28 days	0 days	✓
<b>Particle Size : Grain Size Report (Attachment) Pipet/Sieve Method</b>										
LDPE bag BH1-9	E185A	25-Feb-2022	----	----	----		03-Mar-2022	365 days	----	
<b>Particle Size : Grain Size Report (Attachment) Pipet/Sieve Method</b>										
LDPE bag BH2-3	E185A	25-Feb-2022	----	----	----		03-Mar-2022	365 days	----	
<b>Particle Size : Grain Size Report (Attachment) Pipet/Sieve Method</b>										
LDPE bag BH3-2	E185A	25-Feb-2022	----	----	----		03-Mar-2022	365 days	----	
<b>Particle Size : Grain Size Report (Attachment) Pipet/Sieve Method</b>										
LDPE bag BH4-15	E185A	25-Feb-2022	----	----	----		03-Mar-2022	365 days	----	
<b>Particle Size : Grain Size Report (Attachment) Pipet/Sieve Method</b>										
LDPE bag BH4-9	E185A	25-Feb-2022	----	----	----		03-Mar-2022	365 days	----	



Matrix: Soil/Solid			Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time							
Analyte Group	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
Container / Client Sample ID(s)				Rec	Actual			Rec	Actual	
<b>Particle Size : Particle Size Analysis - Pipette Method</b>										
LDPE bag BH1-9	E184	25-Feb-2022	----	----	----		28-Feb-2022	365 days	3 days	✔
<b>Particle Size : Particle Size Analysis - Pipette Method</b>										
LDPE bag BH2-3	E184	25-Feb-2022	----	----	----		28-Feb-2022	365 days	3 days	✔
<b>Particle Size : Particle Size Analysis - Pipette Method</b>										
LDPE bag BH3-2	E184	25-Feb-2022	----	----	----		28-Feb-2022	365 days	3 days	✔
<b>Particle Size : Particle Size Analysis - Pipette Method</b>										
LDPE bag BH4-15	E184	25-Feb-2022	----	----	----		28-Feb-2022	365 days	3 days	✔
<b>Particle Size : Particle Size Analysis - Pipette Method</b>										
LDPE bag BH4-9	E184	25-Feb-2022	----	----	----		28-Feb-2022	365 days	3 days	✔
<b>Particle Size : Particle Size Analysis - Sieve &lt;2mm</b>										
LDPE bag BH1-9	E182	25-Feb-2022	----	----	----		28-Feb-2022	365 days	3 days	✔
<b>Particle Size : Particle Size Analysis - Sieve &lt;2mm</b>										
LDPE bag BH2-3	E182	25-Feb-2022	----	----	----		28-Feb-2022	365 days	3 days	✔
<b>Particle Size : Particle Size Analysis - Sieve &lt;2mm</b>										
LDPE bag BH3-2	E182	25-Feb-2022	----	----	----		28-Feb-2022	365 days	3 days	✔
<b>Particle Size : Particle Size Analysis - Sieve &lt;2mm</b>										
LDPE bag BH4-15	E182	25-Feb-2022	----	----	----		28-Feb-2022	365 days	3 days	✔



Matrix: Soil/Solid			Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time							
Analyte Group	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
Container / Client Sample ID(s)				Rec	Actual			Rec	Actual	
<b>Particle Size : Particle Size Analysis - Sieve &lt;2mm</b>										
LDPE bag BH4-9	E182	25-Feb-2022	----	----	----		28-Feb-2022	365 days	3 days	✔
<b>Particle Size : Particle Size Analysis - Sieve &gt;2mm</b>										
LDPE bag BH1-9	E181	25-Feb-2022	----	----	----		28-Feb-2022	365 days	3 days	✔
<b>Particle Size : Particle Size Analysis - Sieve &gt;2mm</b>										
LDPE bag BH2-3	E181	25-Feb-2022	----	----	----		28-Feb-2022	365 days	3 days	✔
<b>Particle Size : Particle Size Analysis - Sieve &gt;2mm</b>										
LDPE bag BH3-2	E181	25-Feb-2022	----	----	----		28-Feb-2022	365 days	3 days	✔
<b>Particle Size : Particle Size Analysis - Sieve &gt;2mm</b>										
LDPE bag BH4-15	E181	25-Feb-2022	----	----	----		28-Feb-2022	365 days	3 days	✔
<b>Particle Size : Particle Size Analysis - Sieve &gt;2mm</b>										
LDPE bag BH4-9	E181	25-Feb-2022	----	----	----		28-Feb-2022	365 days	3 days	✔
<b>Physical Tests : Atterberg Limits</b>										
LDPE bag BH1-9	E199	25-Feb-2022	----	----	----		28-Feb-2022	180 days	3 days	✔
<b>Physical Tests : Atterberg Limits</b>										
LDPE bag BH2-3	E199	25-Feb-2022	----	----	----		28-Feb-2022	180 days	3 days	✔
<b>Physical Tests : Atterberg Limits</b>										
LDPE bag BH3-2	E199	25-Feb-2022	----	----	----		28-Feb-2022	180 days	3 days	✔



Matrix: Soil/Solid			Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time							
Analyte Group	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
Container / Client Sample ID(s)				Rec	Actual			Rec	Actual	
<b>Physical Tests : Atterberg Limits</b>										
LDPE bag BH4-15	E199	25-Feb-2022	----	----	----		28-Feb-2022	180 days	3 days	✔
<b>Physical Tests : Atterberg Limits</b>										
LDPE bag BH4-9	E199	25-Feb-2022	----	----	----		28-Feb-2022	180 days	3 days	✔
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH1-1	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH1-10	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH1-11	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH1-12	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH1-13	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH1-14	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH1-15	E144	25-Feb-2022	----	----	----		03-Mar-2022	----	----	



Matrix: Soil/Solid			Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time							
Analyte Group	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
Container / Client Sample ID(s)				Rec	Actual			Rec	Actual	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH1-16	E144	25-Feb-2022	----	----	----		03-Mar-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH1-2	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH1-3	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH1-4	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH1-5	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH1-6	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH1-7	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH1-8	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH1-9	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	



Matrix: **Soil/Solid** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
Container / Client Sample ID(s)				Rec	Actual			Rec	Actual	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH2-1	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH2-10	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH2-11	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH2-12	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH2-13	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH2-14	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH2-15	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH2-16	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH2-2	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	



Matrix: Soil/Solid			Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time							
Analyte Group	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
Container / Client Sample ID(s)				Rec	Actual			Rec	Actual	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH2-3	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH2-4	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH2-5	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH2-6	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH2-7	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH2-8	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH2-9	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH3-1	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH3-10	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	



Matrix: Soil/Solid			Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time							
Analyte Group	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
Container / Client Sample ID(s)				Rec	Actual			Rec	Actual	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH3-11	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH3-12	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH3-13	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH3-14	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH3-15	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH3-16	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH3-2	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH3-3	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH3-4	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	



Matrix: **Soil/Solid** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
Container / Client Sample ID(s)				Rec	Actual			Rec	Actual	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH3-5	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH3-6	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH3-7	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH3-8	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH3-9	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH4-1	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH4-10	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH4-11	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH4-12	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	



Matrix: Soil/Solid			Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time							
Analyte Group	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
Container / Client Sample ID(s)				Rec	Actual			Rec	Actual	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH4-13	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH4-14	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH4-15	E144	25-Feb-2022	----	----	----		03-Mar-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH4-16	E144	25-Feb-2022	----	----	----		03-Mar-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH4-2	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH4-3	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH4-4	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH4-5	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH4-6	E144	25-Feb-2022	----	----	----		28-Feb-2022	----	----	

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 Work Order : SK2200842  
 Client : PINTER & Associates Ltd.  
 Project : 2880



Matrix: **Soil/Solid** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
Container / Client Sample ID(s)				Rec	Actual			Rec	Actual	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH4-7	E144	25-Feb-2022	---	---	---		28-Feb-2022	---	---	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH4-8	E144	25-Feb-2022	---	---	---		28-Feb-2022	---	---	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BH4-9	E144	25-Feb-2022	---	---	---		28-Feb-2022	---	---	

**Legend & Qualifier Definitions**

Rec. HT: ALS recommended hold time (see units).



### Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Soil/Solid**

Evaluation: \* = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation	
			QC	Regular	Actual	Expected		
<b>Analytical Methods</b>								
<b>Laboratory Duplicates (DUP)</b>								
Atterberg Limits	E199	419641	1	5	20.0	5.0	✓	
Moisture Content by Gravimetry	E144	422767	4	64	6.2	5.0	✓	
Particle Size Analysis - Pipette Method	E184	419875	1	5	20.0	5.0	✓	
Particle Size Analysis - Sieve <2mm	E182	419874	1	5	20.0	5.0	✓	
Total Sulfate ion in soil by acidic boiling water extraction, IC	E246.SO4	421524	1	6	16.6	5.0	✓	
<b>Laboratory Control Samples (LCS)</b>								
Atterberg Limits	E199	419641	1	5	20.0	5.0	✓	
Moisture Content by Gravimetry	E144	422767	4	64	6.2	5.0	✓	
Particle Size Analysis - Pipette Method	E184	419875	1	5	20.0	5.0	✓	
Particle Size Analysis - Sieve <2mm	E182	419874	1	5	20.0	5.0	✓	
Particle Size Analysis - Sieve >2mm	E181	419873	1	5	20.0	5.0	✓	
Total Sulfate ion in soil by acidic boiling water extraction, IC	E246.SO4	421524	2	6	33.3	10.0	✓	
<b>Method Blanks (MB)</b>								
Moisture Content by Gravimetry	E144	422767	4	64	6.2	5.0	✓	
Total Sulfate ion in soil by acidic boiling water extraction, IC	E246.SO4	421524	1	6	16.6	5.0	✓	



## Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

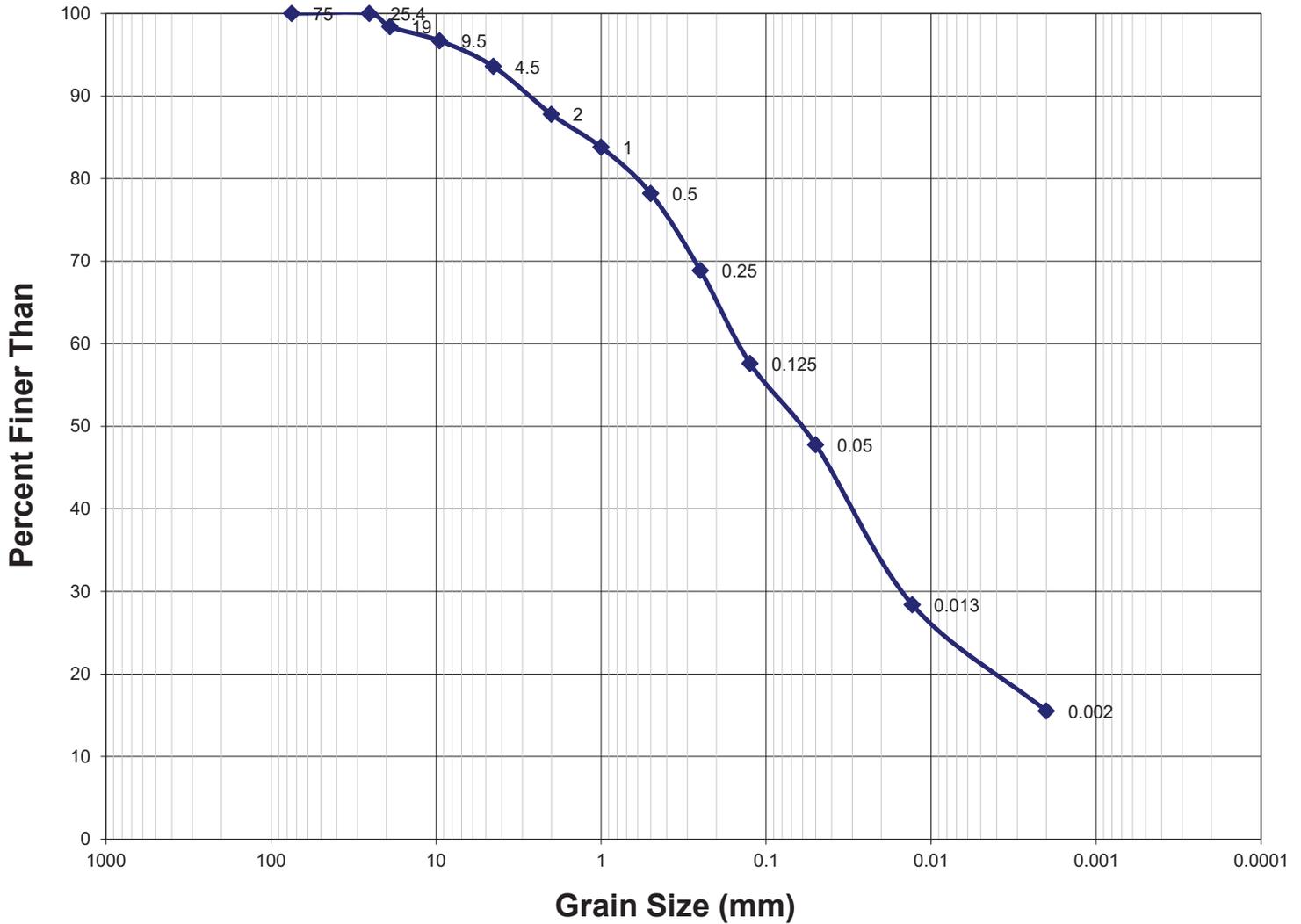
Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Moisture Content by Gravimetry	E144 Saskatoon - Environmental	Soil/Solid	CCME PHC in Soil - Tier 1	Moisture is measured gravimetrically by drying the sample at 105°C. Moisture content is calculated as the weight loss (due to water) divided by the wet weight of the sample, expressed as a percentage.
Particle Size Analysis - Sieve >2mm	E181 Saskatoon - Environmental	Soil/Solid	ASTM D6913-04	Soil samples are disaggregated and sieved through a 2mm sieve. Material retained on the sieve is then further sieved through a series of sieves. The amount passing through the sieves is measured gravimetrically.
Particle Size Analysis - Sieve <2mm	E182 Saskatoon - Environmental	Soil/Solid	ASTM D6913-04	Soil samples are disaggregated and sieved through a 2mm sieve. Material passed through the sieve is then further disaggregated using calgon solution and passed through a series of sieves. The amount passing through the sieves is measured gravimetrically.
Particle Size Analysis - Pipette Method	E184 Saskatoon - Environmental	Soil/Solid	SSIR-51 Method 3.2.1	Soil material is separated from coarse material (>2mm). A specimen is then disaggregated through mixing with Calgon solution. The material is then suspended in solution wherein regular aliquots are taken using a mechanical pipette at specific time intervals. The aliquots are dried and material in suspension determined gravimetrically. The principles of Stokes' Law are applied to determine the amount of material remaining in solution as well as the maximum particle size remaining in solution at the specified time.
Grain Size Report (Attachment) Pipet/Sieve Method	E185A Saskatoon - Environmental	Soil/Solid	SSIR-51 Method 3.2.1	A grain size curve is a graphical representation of the particle sizing of a sample representing the percent passing against the effective particle size.
Atterberg Limits	E199 Saskatoon - Environmental	Soil/Solid	CSSS Ch. 58 (mod)	Atterberg Limits are measures of physical properties of fine grained soils. Liquid Limit (LL) is the water content where soil behaviour changes from plastic to liquid, and is determined by Casagrande cup. Plastic Limit (PL) is the water content where soil begins to exhibit plastic behaviour, and is measured as the moisture content of a 3 mm diameter thread of soil which begins to crumble when rolled. Plasticity Index (PI) is equal to LL - PL.
Total Sulfate ion in soil by acidic boiling water extraction, IC	E246.S04 Edmonton - Environmental	Soil/Solid	CSA-A23.2-3B	The dried solid is mixed with water and acid then heated. After filtration the liquid is ready for analysis by IC with conductivity detector.
Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total ion Sulfate in soil or concrete preparation	EP246.T Edmonton - Environmental	Soil/Solid	CSA-A23.2B	The dried solid is mixed with water and acid then heated. After filtration the liquid is ready for analysis.

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<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Dry and Grind	EPP442 Saskatoon - Environmental	Soil/Solid	Soil Sampling and Methods of Analysis, Carter 2008	After removal of any coarse fragments and reservation of wet subsamples a portion of homogenized sample is set in a tray and dried at less than 60°C until dry. The sample is then particle size reduced with an automated crusher or mortar and pestle, typically to <2 mm. Further size reduction may be needed for particular tests.

## Particle Size Distribution Curve



### Summary of Results

#### Unified Soil Classification System (USCS)

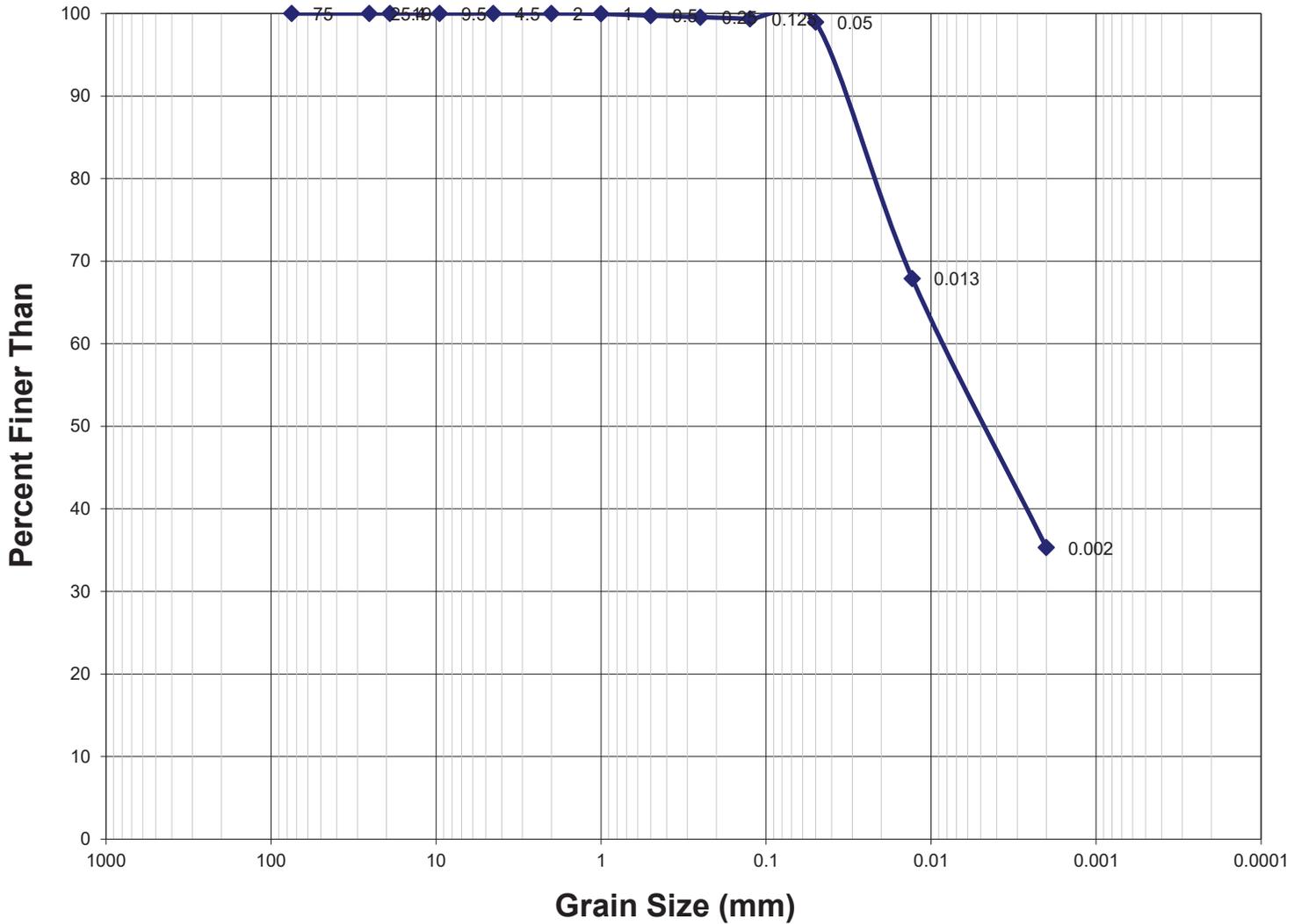
Size Class	Size Range	Wt. (%)
Cobbles	> 3"	0
Gravel	4.75mm - 3"	6
Coarse Sand	2.0mm - 4.75mm	6
Medium Sand	0.425mm - 2.0mm	10
Fine Sand	0.075mm - 0.425mm	27
Fines	< 0.075mm	51

#### Canadian Soil Survey Committee (CSSC)

Size Class	Size Range	Wt. (%)
Cobbles	> 3"	0
Gravel	2mm - 3"	12
Sand	0.05mm - 2mm	40
Silt	0.002mm - 0.05mm	32
Clay	< 0.002mm	16

Texture Sample contains material greater than 4.75mm. T

## Particle Size Distribution Curve



### Summary of Results

#### Unified Soil Classification System (USCS)

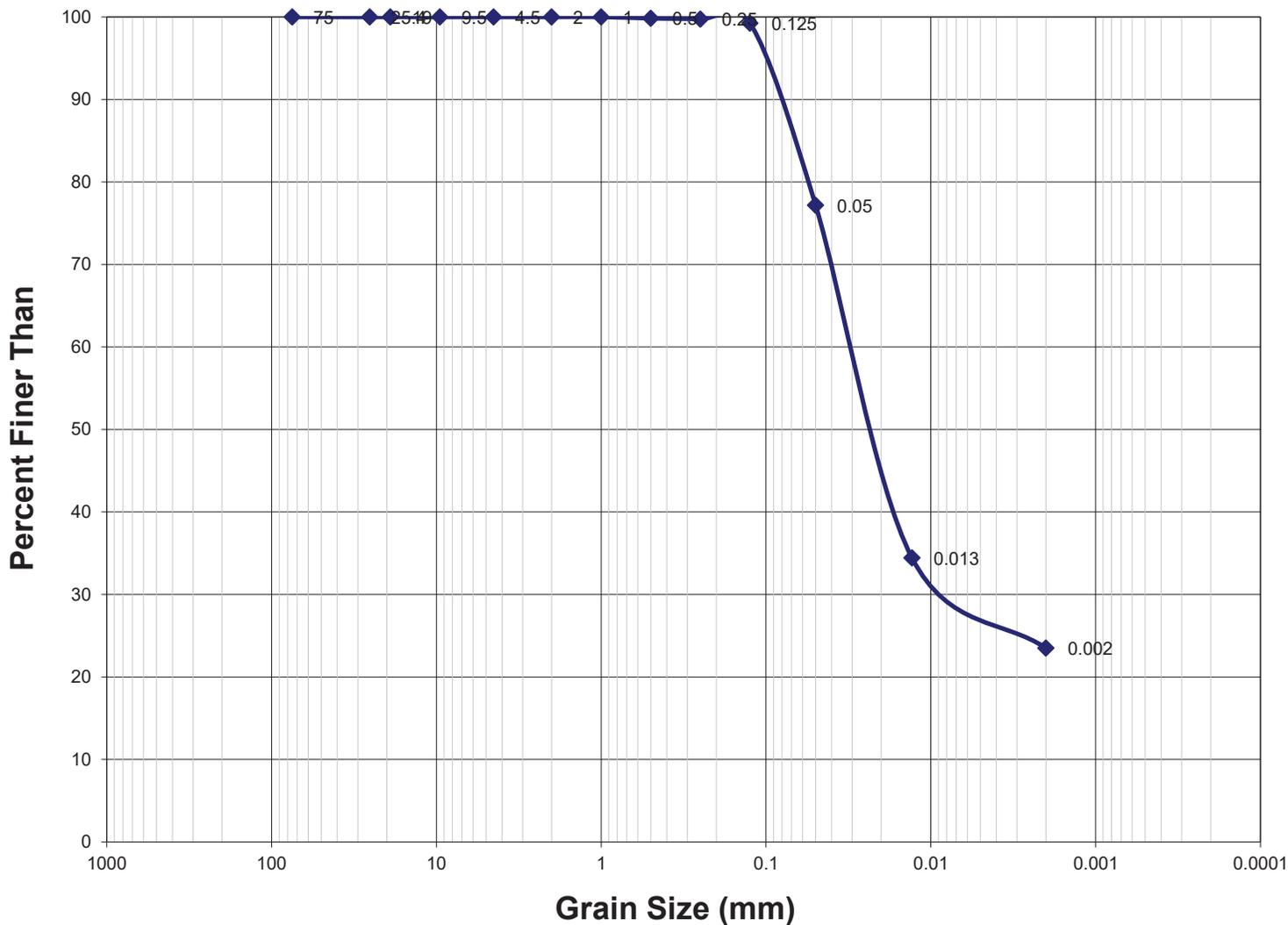
Size Class	Size Range	Wt. (%)
Cobbles	> 3"	0
Gravel	4.75mm - 3"	0
Coarse Sand	2.0mm - 4.75mm	0
Medium Sand	0.425mm - 2.0mm	0
Fine Sand	0.075mm - 0.425mm	1
Fines	< 0.075mm	99

#### Canadian Soil Survey Committee (CSSC)

Size Class	Size Range	Wt. (%)
Cobbles	> 3"	0
Gravel	2mm - 3"	0
Sand	0.05mm - 2mm	1
Silt	0.002mm - 0.05mm	64
Clay	< 0.002mm	35

Texture: Silty clay loam

## Particle Size Distribution Curve



### Summary of Results

#### Unified Soil Classification System (USCS)

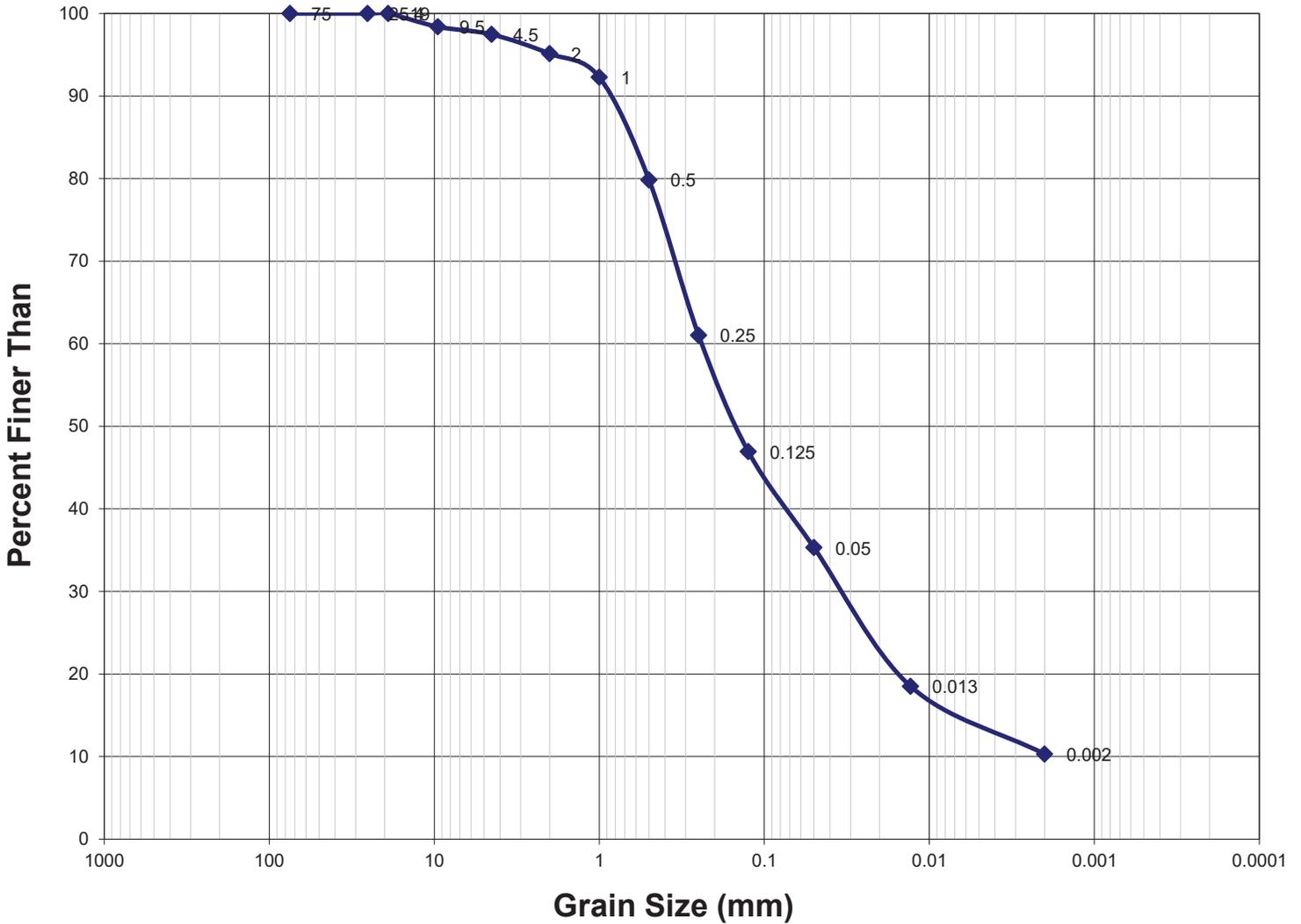
Size Class	Size Range	Wt. (%)
Cobbles	> 3"	0
Gravel	4.75mm - 3"	0
Coarse Sand	2.0mm - 4.75mm	0
Medium Sand	0.425mm - 2.0mm	0
Fine Sand	0.075mm - 0.425mm	15
Fines	< 0.075mm	85

#### Canadian Soil Survey Committee (CSSC)

Size Class	Size Range	Wt. (%)
Cobbles	> 3"	0
Gravel	2mm - 3"	0
Sand	0.05mm - 2mm	23
Silt	0.002mm - 0.05mm	54
Clay	< 0.002mm	23

Texture: Silt loam

## Particle Size Distribution Curve



### Summary of Results

#### Unified Soil Classification System (USCS)

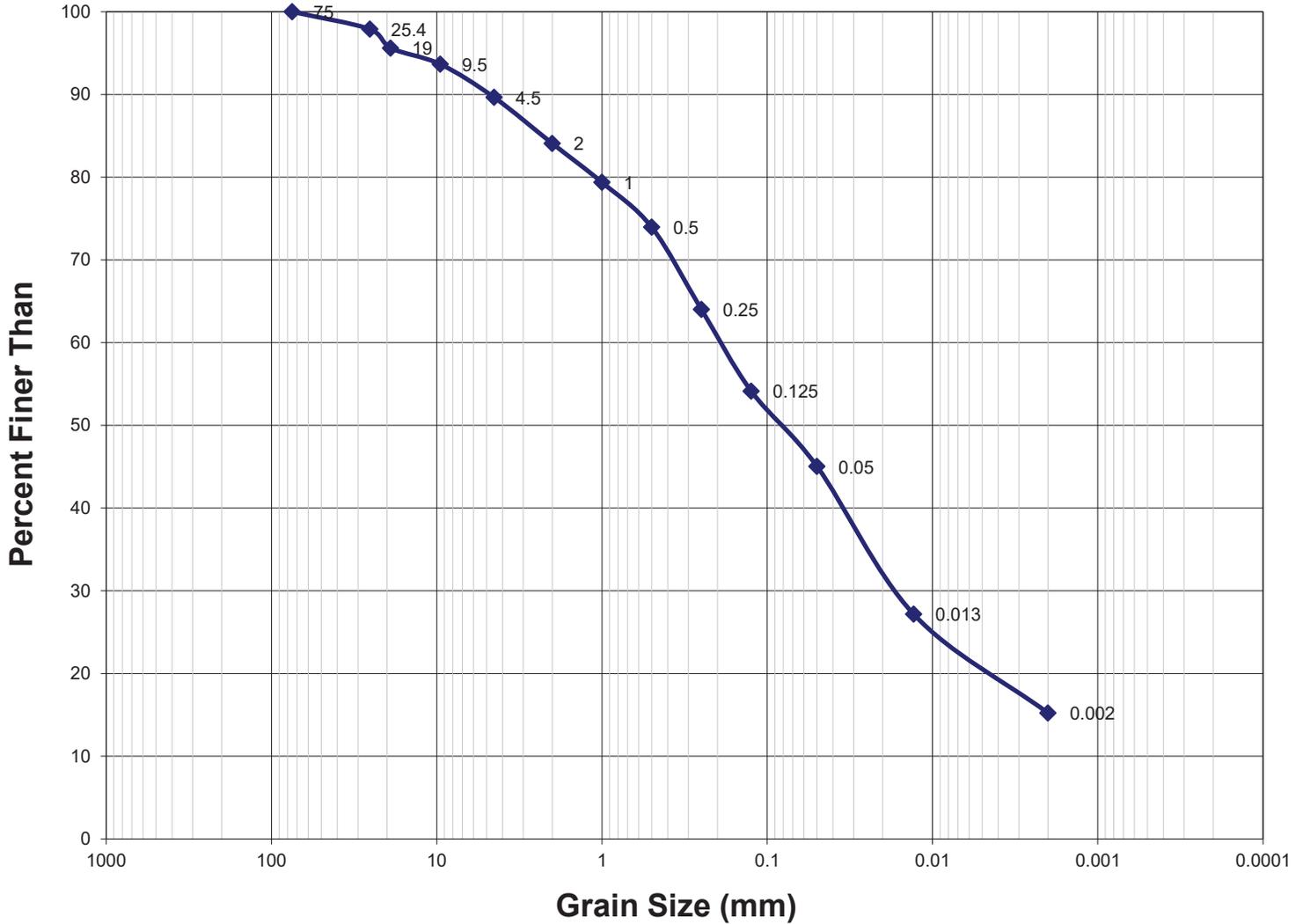
Size Class	Size Range	Wt. (%)
Cobbles	> 3"	0
Gravel	4.75mm - 3"	2
Coarse Sand	2.0mm - 4.75mm	2
Medium Sand	0.425mm - 2.0mm	15
Fine Sand	0.075mm - 0.425mm	41
Fines	< 0.075mm	39

#### Canadian Soil Survey Committee (CSSC)

Size Class	Size Range	Wt. (%)
Cobbles	> 3"	0
Gravel	2mm - 3"	5
Sand	0.05mm - 2mm	60
Silt	0.002mm - 0.05mm	25
Clay	< 0.002mm	10

Texture Sample contains material greater than 4.75mm. T

## Particle Size Distribution Curve



### Summary of Results

#### Unified Soil Classification System (USCS)

Size Class	Size Range	Wt. (%)
Cobbles	> 3"	0
Gravel	4.75mm - 3"	10
Coarse Sand	2.0mm - 4.75mm	6
Medium Sand	0.425mm - 2.0mm	10
Fine Sand	0.075mm - 0.425mm	26
Fines	< 0.075mm	48

#### Canadian Soil Survey Committee (CSSC)

Size Class	Size Range	Wt. (%)
Cobbles	> 3"	0
Gravel	2mm - 3"	16
Sand	0.05mm - 2mm	39
Silt	0.002mm - 0.05mm	30
Clay	< 0.002mm	15

Texture: Sample contains material greater than 4.75mm. T



**Report To**  
 Company: PINTER & Associates Ltd.  
 Contact: 710A 48th Street East  
 Saskatoon, SK S7K 5B4  
 Phone: 306.244.1710 Fax: 306.933.4986  
 Invoice To Same as Report?  Yes  No  
 Hardcopy of Invoice with Report?  Yes  No  
 Company: SAME  
 Contact: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

**Report Format / Distribution**  
 Standard  Other  Digital  Fax  
 PDF  Excel  
 Email 1: kevin.mathison@pinter.ca  
 Email 2: jarett.crosby@pinter.ca  
 Email 3: reni.valois@pinter.ca  
 Client / Project Information  
 Job #: 2880  
 PO / AFE: \_\_\_\_\_  
 LSD: \_\_\_\_\_  
 Quote #: \_\_\_\_\_

**Service Requested (Rush for r**  
 Regular (Standard Turnaround Tim  
 Priority (2-4 Business Days) - 50%  
 Emergency (1-2 Bus. Days) - 100%  
 Same Day or Weekend Emergency  
 Analy  
 Please indicate below Filterec



Telephone : +1 306 668 8370

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mm-yy)	Time (hh:mm)	Sample Type	MOIST-SK	GRAIN SIZE-SK	ATTERBERG-SK	SO4-S-CSA-A23-ED	Number of Container
BH1-1					X				1
BH1-2					X				1
BH1-3					X				1
BH1-4					X				1
BH1-5					X				1
BH1-6					X				1
BH1-7					X				1
BH1-8					X	X			1
BH1-9					X	X	X		1
BH1-10					X				1
BH1-11					X				1
BH1-12					X				1

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

**SHIPMENT RELEASE (client use)**  
 Released by: \_\_\_\_\_ Date (dd-mm-yy): \_\_\_\_\_ Time (hh-mm): \_\_\_\_\_

**SHIPMENT RECEPTION (lab use only)**  
 Received by: *[Signature]* Date: Feb 25 Time: 4:45 Temperature: 18.4°C

**SHIPMENT VERIFICATION (lab use only)**  
 Verified by: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_  
 Observations: Yes / No ?  
 If Yes add SIF



Report To		PINTER & Associates Ltd.		Report Format / Distribution		<input checked="" type="checkbox"/> Standard <input type="checkbox"/> Other <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> Excel <input type="checkbox"/> Digital <input type="checkbox"/> Fax	
Company:		710A 48th Street East		Email 1:		<input type="radio"/> Regular (Standard Turnaround Times - Business Days) <input type="radio"/> Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT <input type="radio"/> Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT <input type="radio"/> Same Day or Weekend Emergency - Contact ALS to Confirm TAT	
Address:		Saskatoon, SK S7K 5B4		Email 2:		<b>Service Requested</b> (Rush for routine analysis subject to availability)	
Phone:		306.244.1710		Email 3:		<input type="radio"/> Analysis Request	
Invoice To		Same as Report ? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Client / Project Information		Please indicate below Filtered, Preserved or both (F, P, F/P)	
Hardcopy of Invoice with Report?		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Job #:		2880	
Company:		SAME		PO / AFE:		LSD:	
Contact:				Quote #:			
Address:				ALS Contact:		Jessica Spira	
Phone:				Sampler:			
Fax:				Date		(dd-mm-yy)	
Lab Work Order #				Time		(hh:mm)	
(lab use only)				Sample Type			
Sample #		(This description will appear on the report)		Date		Time	
				(dd-mm-yy)		(hh:mm)	
BH2-11						MOIST-SK	
BH2-12						GRAIN SIZE-SK	
BH2-13						ATTERBERG-SK	
BH2-14						SO4-S-CSA-A23-ED	
BH2-15							
BH2-16							
BH3-1							
BH3-2							
BH3-3							
BH3-4							
BH3-5							
BH3-6							
<b>Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details</b>							

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

**By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.**

**Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.**

SHIPMENT RELEASE (client use)		SHIPMENT RECEPTION (lab use only)		SHIPMENT VERIFICATION (lab use only)	
Released by:	Date (dd-mm-yy)	Received by:	Date:	Verified by:	Date:
	Time (hh:mm)		Time:		Time:
			Temperature:		Observations:
			°C		Yes / No ?
					If Yes add SIF

<b>Report To</b>		<b>Report Format / Distribution</b>		<b>Service Requested</b> (Rush for routine analysis subject to availability)	
Company: PINTER & Associates Ltd.		<input checked="" type="checkbox"/> Standard <input type="checkbox"/> Other <input checked="" type="checkbox"/> PDF <input type="checkbox"/> Excel <input type="checkbox"/> Digital <input type="checkbox"/> Fax		<input checked="" type="radio"/> Regular (Standard Turnaround Times - Business Days) <input type="radio"/> Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT <input type="radio"/> Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT <input type="radio"/> Same Day or Weekend Emergency - Contact ALS to Confirm TAT	
Contact: 710A 48th Street East		Email 1: kevin.mathison@pinter.ca		<b>Analysis Request</b> Please indicate below Filtered, Preserved or both (F, P, F/P)	
Address: Saskatoon, SK S7K 5B4		Email 2: jarett.crosby@pinter.ca			
Phone: 306.244.1710 Fax: 306.933.4986		Email 3: remi.valois@pinter.ca			
Invoice To Same as Report? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Client / Project Information			
Hardcopy of Invoice with Report? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Job #: 2880			
Company: SAME		PO / AFE:			
Contact:		LSD:			
Address:		Quote #:			
Phone:		ALS Contact: Jessica Spira		Sampler:	
Lab Work Order # (lab use only)					
<b>Sample #</b>	<b>Sample Identification</b> (This description will appear on the report)	<b>Date</b> (dd-mm-yy)	<b>Time</b> (hh:mm)	<b>Sample Type</b>	<b>Number of Containers</b>
BH3-7				MOIST-SK	1
BH3-8				GRAIN SIZE-SK	1
BH3-9				ATTERBERG-SK	1
BH3-10				SO4-S-CSA-A23-ED	1
BH3-11					1
BH3-12					1
BH3-13					1
BH3-14					1
BH3-15					1
BH3-16					1
BH4-1					1
BH4-2					1

**Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details**

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

**By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.**

**Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.**

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)			SHIPMENT VERIFICATION (lab use only)				
Released by:	Date (dd-mm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature: °C	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF



Report To		PINTER & Associates Ltd.		Report Format / Distribution		<input checked="" type="checkbox"/> Standard <input type="checkbox"/> Other <input checked="" type="checkbox"/> PDF <input type="checkbox"/> Excel <input type="checkbox"/> Digital <input type="checkbox"/> Fax		Service Requested (Rush for routine analysis subject to availability)	
Company:		710A 48th Street East		<input type="checkbox"/> Standard <input type="checkbox"/> Other <input type="checkbox"/> PDF <input type="checkbox"/> Excel <input type="checkbox"/> Digital <input type="checkbox"/> Fax		<input checked="" type="radio"/> Regular (Standard Turnaround Times - Business Days) <input type="radio"/> Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT <input type="radio"/> Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT <input type="radio"/> Same Day or Weekend Emergency - Contact ALS to Confirm TAT			
Address:		Saskatoon, SK S7K 5B4		Email 1: <a href="mailto:kevin.mathison@pinter.ca">kevin.mathison@pinter.ca</a>		Email 2: <a href="mailto:jarett.crosby@pinter.ca">jarett.crosby@pinter.ca</a>		Email 3: <a href="mailto:reni.valois@pinter.ca">reni.valois@pinter.ca</a>	
Phone:		306.244.1710		Fax: 306.933.4986		Client / Project Information		Job #: 2880	
Invoice To		Same as Report?		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		PO / AFE:		LSD:	
Hardcopy of Invoice with Report?		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		ALS Contact:		Jessica Spira		Sampler:	
Company:		SAME		Quote #:					
Contact:									
Address:									
Phone:									
Lab Work Order #									
(lab use only)									
Sample #		Sample Identification (This description will appear on the report)		Date (dd-mmm-yy)		Time (hh:mm)		Sample Type	
BH4-3								MOIST-SK	
BH4-4								GRAIN SIZE-SK	
BH4-5								ATTERBERG-SK	
BH4-6								SO4-S-CSA-A23-ED	
BH4-7									
BH4-8									
BH4-9									
BH4-10									
BH4-11									
BH4-12									
BH4-13									
BH4-14									
<p style="text-align: center;"><b>Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details</b></p>									

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

**By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.**

**Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.**

SHIPMENT RELEASE (client use)		SHIPMENT RECEPTION (lab use only)		SHIPMENT VERIFICATION (lab use only)	
Released by:	Date (dd-mm-yy)	Received by:	Date:	Verified by:	Date:
	Time (hh-mm)		Time:		Time:
			Temperature:		Observations:
			°C		Yes / No ?
					If Yes add SIF



# UNCONFINED COMPRESSION TEST REPORT

(Test Reference: ASTM D 2166)



**SNC • LAVALIN**

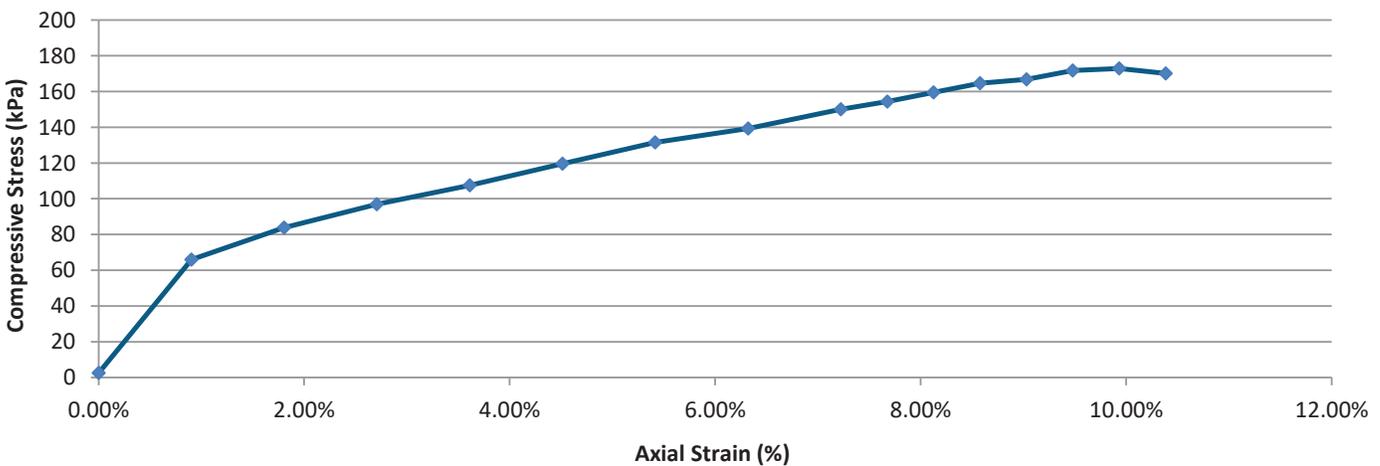
Sample: PAAL 2880 BH1 at 9m

Water Content %	11.7%	Average Pocket Pen Result	N/A	
Mass of Test Specimen, g	1233.73	Stress	load/(corr. area)	
Wet Density, kg/m <sup>3</sup>	2234	Corr. Area	A <sub>0</sub> /(1 - unit strain)	
Dry Density, kg/m <sup>3</sup>	1999	Unit Strain	ΔL/L <sub>0</sub>	<b>Consistency</b>
Specific Gravity (Assumed)	2.70	L <sub>0</sub> /D <sub>0</sub>	1.99	Very soft
Degree of Saturation	0.90	Strain Rate	0.90 %/min	Soft
Initial Diameter, D <sub>0</sub> , cm	7.07	Unconfined Compressive Strength, q <sub>u</sub>	173 kPa	Medium
Initial Area, A <sub>0</sub> , cm <sup>2</sup>	39.21			Stiff
Initial Height, L <sub>0</sub> , cm	14.09			Very stiff
Initial Volume, V <sub>0</sub> , cm <sup>3</sup>	552.28			Hard
				>383

Elapsed Time, min	Load-cell Dial Reading	Axial Load, kg	Strain Dial	Total Strain, mm	Unit Strain	Corrected Area, cm <sup>2</sup>	Stress, kPa
0.0	11	1.01	0	0.00	0.00%	39.21	2.5
1.0	68	26.65	50	1.27	0.90%	39.57	66.0
2.0	85	34.18	100	2.54	1.81%	39.93	83.9
3.0	98	39.83	150	3.82	2.71%	40.30	96.9
4.0	109	44.60	200	5.09	3.61%	40.68	107.5
5.0	122	50.11	250	6.36	4.52%	41.06	119.7
6.0	135	55.59	300	7.63	5.42%	41.45	131.5
7.0	144	59.49	350	8.90	6.32%	41.85	139.4
8.0	156	64.70	400	10.18	7.22%	42.26	150.1
8.5	161	66.87	425	10.81	7.68%	42.47	154.4
9.0	167	69.45	450	11.45	8.13%	42.68	159.6
9.5	173	72.02	475	12.08	8.58%	42.89	164.7
10.0	176	73.31	500	12.72	9.03%	43.10	166.8
10.5	182	75.88	525	13.36	9.48%	43.32	171.8
11	184	76.74	550	13.99	9.93%	43.53	172.9
11.5	182	75.88	575	14.63	10.38%	43.75	170.1



Post Test



Checker: *Don M. [Signature]*

Reviewer: *Don M. [Signature]*

The testing services reported here have been performed in accordance with accepted local industry standards.

The results presented are for the sole use of the designated client only.

This report constitutes a testing service only. It does not represent any interpretation or opinion regarding specification compliance or material suitability.

Engineering interpretation will be provided by SNC Lavalin upon request

**Client:** Pinter and Associates Ltd.  
**Project:** 2880 - Floral Subdivision and CDR  
**Project #:** 680444  
**Date:** 8-Mar-2022

Geoscience & Materials



# UNCONFINED COMPRESSION TEST REPORT

(Test Reference: ASTM D 2166)



**SNC • LAVALIN**

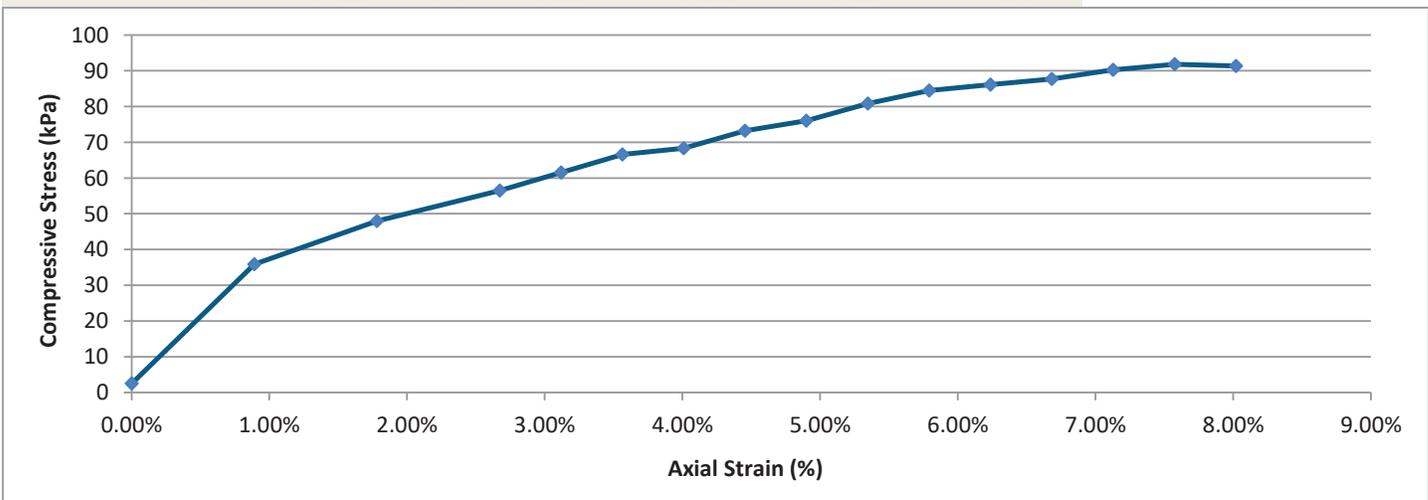
Sample: PAAL 2880 BH2 at 10.5m

Water Content %	14.3%	Average Pocket Pen Result	N/A	
Mass of Test Specimen, g	1276.2	Stress	load/(corr. area)	
Wet Density, kg/m <sup>3</sup>	2249	Corr. Area	A <sub>o</sub> /(1 - unit strain)	
Dry Density, kg/m <sup>3</sup>	1967	Unit Strain	ΔL/L <sub>o</sub>	<b>Consistency</b>
Specific Gravity (Assumed)	2.70	L <sub>o</sub> /D <sub>o</sub>	2.01	Very soft
Degree of Saturation	1.00	Strain Rate	0.89 %/min	Soft
Initial Diameter, D <sub>o</sub> , cm	7.11	Unconfined Compressive Strength, q <sub>u</sub>	92 kPa	Medium
Initial Area, A <sub>o</sub> , cm <sup>2</sup>	39.75			Stiff
Initial Height, L <sub>o</sub> , cm	14.27			Very stiff
Initial Volume, V <sub>o</sub> , cm <sup>3</sup>	567.35			Hard
				>383

Elapsed Time, min	Load-cell Dial Reading	Axial Load, kg	Strain Dial	Total Strain, mm	Unit Strain	Corrected Area, cm <sup>2</sup>	Stress, kPa
0.0	8	1.01	0	0.00	0.00%	39.75	2.5
1.0	39	14.67	50	1.27	0.89%	40.11	35.9
2.0	50	19.81	100	2.54	1.78%	40.47	48.0
3.0	58	23.55	150	3.82	2.67%	40.84	56.5
3.5	63	25.76	175	4.45	3.12%	41.03	61.6
4.0	68	27.97	200	5.09	3.56%	41.22	66.6
4.5	70	28.86	225	5.72	4.01%	41.41	68.3
5.0	75	31.08	250	6.36	4.46%	41.60	73.3
5.5	78	32.40	275	7.00	4.90%	41.80	76.0
6.0	83	34.62	300	7.63	5.35%	41.99	80.8
6.5	87	36.36	325	8.27	5.79%	42.19	84.5
7.0	89	37.22	350	8.90	6.24%	42.39	86.1
7.5	91	38.09	375	9.54	6.68%	42.60	87.7
8.0	94	39.39	400	10.18	7.13%	42.80	90.3
8.5	96	40.26	425	10.81	7.57%	43.01	91.8
9	96	40.26	450	11.45	8.02%	43.21	91.4



Post Test



Checker: *Don M. [Signature]*      Reviewer: *Don M. [Signature]*

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**Project #:** 680444  
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# UNCONFINED COMPRESSION TEST REPORT

(Test Reference: ASTM D 2166)



**SNC • LAVALIN**

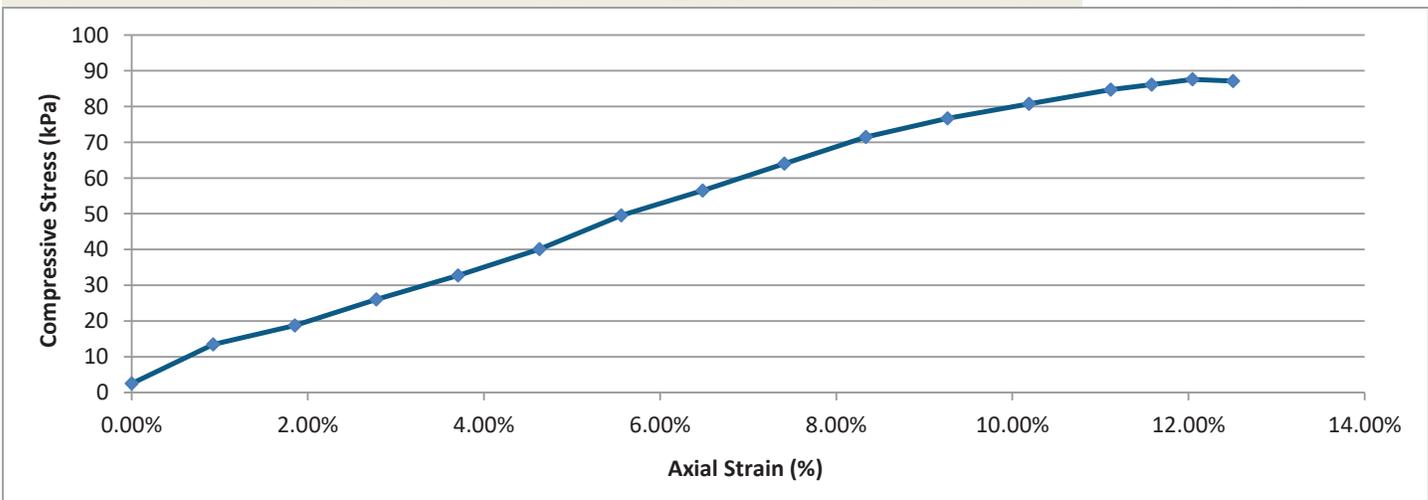
Sample: PAAL 2880 BH3 at 10.5m

Water Content %	11.6%	Average Pocket Pen Result	N/A	
Mass of Test Specimen, g	1249.95	Stress	load/(corr. area)	
Wet Density, kg/m <sup>3</sup>	2296	Corr. Area	A <sub>o</sub> /(1 - unit strain)	
Dry Density, kg/m <sup>3</sup>	2058	Unit Strain	ΔL/L <sub>o</sub>	<b>Consistency</b>
Specific Gravity (Assumed)	2.70	L <sub>o</sub> /D <sub>o</sub>	1.93	Very soft
Degree of Saturation	1.00	Strain Rate	0.93 %/min	Soft
Initial Diameter, D <sub>o</sub> , cm	7.11	Unconfined Compressive Strength, q <sub>u</sub>	<b>88 kPa</b>	Medium
Initial Area, A <sub>o</sub> , cm <sup>2</sup>	39.65			Stiff
Initial Height, L <sub>o</sub> , cm	13.73			Very stiff
Initial Volume, V <sub>o</sub> , cm <sup>3</sup>	544.32			Hard
				>383

Elapsed Time, min	Load-cell Dial Reading	Axial Load, kg	Strain Dial	Total Strain, mm	Unit Strain	Corrected Area, cm <sup>2</sup>	Stress, kPa
0.0	7	1.01	0	0.00	0.00%	39.65	2.5
1.0	17	5.48	50	1.27	0.93%	40.02	13.4
2.0	22	7.71	100	2.54	1.85%	40.40	18.7
3.0	29	10.84	150	3.82	2.78%	40.78	26.1
4.0	36	13.74	200	5.09	3.71%	41.17	32.7
5.0	43	17.01	250	6.36	4.63%	41.57	40.1
6.0	52	21.21	300	7.63	5.56%	41.98	49.5
7.0	59	24.43	350	8.90	6.49%	42.40	56.5
8.0	67	27.97	400	10.18	7.41%	42.82	64.1
9.0	75	31.52	450	11.45	8.34%	43.25	71.5
10.0	81	34.18	500	12.72	9.27%	43.70	76.7
11.0	86	36.36	550	13.99	10.19%	44.15	80.8
12.0	91	38.53	600	15.26	11.12%	44.61	84.7
12.5	93	39.39	625	15.90	11.58%	44.84	86.2
13	95	40.26	650	16.54	12.04%	45.08	87.6
13.5	95	40.26	675	17.17	12.51%	45.32	87.1



Post Test



Checker: *Don Mupfister*      Reviewer: *Don Mupfister*

The testing services reported here have been performed in accordance with accepted local industry standards.

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Engineering interpretation will be provided by SNC Lavalin upon request

**Client:** Pinter and Associates Ltd.  
**Project:** 2880 - Floral Subdivision and CDR  
**Project #:** 680444  
**Date:** 8-Mar-2022

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**Appendix E**  
**Selected Site Photographs**

**CONFIDENTIAL**



Photograph #1: Drilling BH1.



Photograph #2: Drilling BH3.

**CONFIDENTIAL**



Photograph #3: Piezometer installed in BH4.



Photograph #4: Underground gas line markings.

**Appendix H**  
**Phase 1 & 2 ESA**



**PROJECT: Phase I Environmental Site Assessment  
Parcel B and Parcel C of NE-35-35-04-W3M  
RM of Corman Park, Saskatchewan**

**PREPARED FOR: 101046965 Saskatchewan Ltd.**





02 March 2022

File: 22-2880-1

101046965 Saskatchewan Ltd.  
Box 105 Site 601 RR6  
Saskatoon SK S7K 3J9

Attention: Mr. Hewison and Mr. Beaulac

**Subject: Phase I Environmental Site Assessment  
Parcel B and Parcel C of NE-35-35-04-W3M  
RM of Corman Park, Saskatchewan**

---

Please find attached one (1) copy of our Phase I Environmental Site Assessment (ESA) report for the above-referenced property located in the RM of Corman Park, Saskatchewan.

If you have any questions, concerns, or require further information, please call the undersigned at (306) 244-1710.

Yours Sincerely,  
**PINTER & Associates Ltd.**

A black and white image of a handwritten signature in white ink on a black background. The signature is cursive and appears to read "Jessica Cutter".

Jessica Cutter, M. Sc.  
Project Manager

h:\2) projects\2880 floral subdivision development cdr\2880-1 phase i esa\2880-1 report\drafts\2880-1 floral subdivision development  
ph i esa 02mar22 final.docx

**Phase I Environmental Site Assessment  
Parcel B and Parcel C of NE-35-35-04-W3M  
RM of Corman Park, Saskatchewan**

**Prepared For:  
101046965 SASKATCHEWAN LTD.**

**Prepared By:  
PINTER & Associates Ltd.**

**02 March 2022  
File: 22-2880-1**





## Glossary of Terms and Abbreviations

Asbestos	Thin fibrous silicate minerals used historically in building materials such as pipe insulation, spray-on fireproofing, ceiling tiles, and flooring underlay.
Asl	Above Sea Level
ACM	Asbestos-containing materials
AST	Aboveground fuel storage tank
Ballast	Provides starting voltage and regulates the current to a lamp in a fluorescent lighting system.
Contaminants	Identified or suspected materials, compounds, chemicals, metals, and other products (usually man-made) that may be present in concentrations that exceed the applicable regulatory criteria or guidelines.
ESA	Environmental Site Assessment
Fire Insurance Maps	Historical city plans that were used to evaluate fire risks and to determine insurance premiums. The maps may include items such as building materials, USTs, ASTs, and land use at the time of publication.
Hantavirus	Virus found within deer mouse droppings, urine, and saliva. The virus can be transmitted to humans through airborne particles causing flu-like symptoms that may progress to a fatal condition if left untreated.
Henderson/Polk Directories	The Directories list civic addresses and the occupant(s) on a yearly basis. Directories were prepared from 1908 to 2000.
Km	kilometres
M	metres
m <sup>2</sup>	Square metres
m bgs	metres below ground surface
PAHs	Polycyclic aromatic hydrocarbons. Compounds created through the incomplete burning of coal, oil, and gas.
PCBs	Polychlorinated biphenyls. Compounds used historically as coolants and insulating fluids in transformers and capacitors.
Petroleum Hydrocarbons	PHC (see below)
ODS	Ozone-depleting substances. Substances that deplete the ozone layer such as halons and chlorofluorocarbons (CFCs).
Phase I ESA	Phase I Environmental Site Assessment. The purpose of a Phase I ESA is to review current and historical information to identify potential environmental concerns. No sampling or analysis of samples is carried out during a Phase I ESA.
Phase II ESA	Phase II Environmental Site Assessment. The purpose of a Phase II ESA is to evaluate the environmental concerns identified in a Phase I ESA through the collection of field and laboratory data.
Phase III ESR	Phase III Environmental Site Remediation. The purpose/objective of a Phase III ESR is to obtain an environmental release from either the



	Authority-Having-Jurisdiction and/or the Consultant. There are many options that can be used to attain this objective.
PHC	Petroleum hydrocarbons. Compounds that result from the refining of crude oil. Typically, these compounds include gasoline, diesel fuel, fuel oil, jet fuels, kerosene, non-synthetic motor and hydraulic oils.
Shelterbelt	A line of trees or shrubs planted to protect an area, especially a farm field, from strong winds and the erosion they cause.
Site or Subject Property	Refers to the land, buildings and appurtenances within the boundary of the property being assessed.
SMOE	Saskatchewan Ministry of Environment
SOPC	Substance of Potential Concern
SWSA	Saskatchewan Water Security Agency
UFFI	Urea Formaldehyde Foam Insulation. Used as an insulation product from the mid-1970s to 1980.
UST	Underground fuel storage tank
VOC	Volatile organic compounds. Gases emitted from certain solids or liquids.



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## Executive Summary

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PINTER & Associates Ltd. (PINTER) carried out a Phase I Environmental Site Assessment on the property located at Parcel B and Parcel C of NE-35-35-04-W3M (the Subject Property), in the Rural Municipality (RM) of Corman Park, Saskatchewan (SK). The Subject Property consists of a commercial building with a reception area, individual office spaces, laboratory spaces, a kitchen, and a mezzanine. RV trailers occupy the northern region of the Subject Property. Storage sea cans occupy the eastern region of the Subject Property. A parking lot occupies the western region of the Subject Property. Adjacent land use to the Subject Property includes roadways, commercial properties, industrial properties, agricultural land, and undeveloped land

Our assessment did not identify evidence of actual or potential on-site contamination that could affect the overall condition of the Subject Property. There is no evidence of actual off-site contamination or potential off-site impacts that could travel to the Subject Property.

We note that the following special attention items may be present in the Subject Property building and will require proper management and disposal if renovation or demolition occurs, affecting these materials: the transformer may contain PCBs, fire extinguishers and refrigeration units may contain ozone-depleting substances (ODS), fluorescent light bulbs and older model thermostats likely contain mercury, and moisture-affected building materials were also observed within the Subject Property building.

No further environmental assessment work is recommended for the Subject Property.




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## 1.0

## INTRODUCTION

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101046965 Saskatchewan Ltd.(the CLIENT) retained PINTER & Associates Ltd. (PINTER) to carry out a Phase I Environmental Site Assessment (ESA) on the property located at Parcel B and Parcel C of NE-35-35-04-W3M (the Subject Property), in the RM of Corman Park, Saskatchewan (SK). The location of the Subject Property is shown on Figure 1, Appendix A.

Authorization to complete the Phase I ESA was provided in writing by the CLIENT on 31 January 2022.

The purpose of the Phase I ESA was to identify actual and potential site contamination resulting from historical and current land use on the Subject Property, and on adjoining and neighbouring properties that could affect the Subject Property.

### 1.1. SCOPE OF WORK

The Phase I ESA was performed in accordance with the principles and practices established by the Canadian Standards Association (CSA) in the document titled “Z768-01 (R2016); Phase I Environmental Site Assessment” (CSA, 2016). The Phase I ESA is based on a records review, a visual survey of the Subject Property, interviews, evaluation of information, and reporting. The historical information review was restricted to information available to PINTER during the term of this assessment.

The scope of work included the following tasks:

- Review historical land titles (for a minimum of 60 years), historical aerial photographs, publicly-available RM documents, fire insurance maps, Henderson/Polk Directories, and provincial regulatory databases.
- Review of information at the RM of Corman Park.
- Review of previous environmental reports, if made available.
- Interview people with information pertaining to current and historical activities on the Subject Property.
- Perform a Subject Property reconnaissance and inspection.
- Evaluate the data and prepare a report summarizing the assessment and findings.




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## 2.0

## SITE DESCRIPTION

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### 2.1. GENERAL DESCRIPTION

The Subject Property is located at Parcel B and Parcel C of NE-35-35-04-W3M in the RM of Corman Park. The Subject Property consists of a commercial building with a reception area, individual office spaces, laboratory spaces, a kitchen, and mezzanine. RV trailers occupied the northern portion of the Subject Property. Storage sea cans occupy the eastern region of the Subject Property. A parking lot occupies the western region of the Subject Property. Adjacent land use to the Subject Property includes roadways, commercial properties, industrial properties, agricultural land, and undeveloped land. Figure 2, Appendix A presents the adjacent land uses.

### 2.2. ZONING

The Subject Property is zoned Light Industrial District (M1) (RM of Corman Park No. 09/94). A list of the permitted and discretionary uses is included in the zoning bylaws presented in Appendix B. Table A presents a summary of adjoining and neighbouring land uses.

**TABLE A – Summary of Adjoining and Neighbouring Land Uses**

Direction from Subject Property	Present Land Use
North	Township Road 360, Undeveloped Land, Rail Line
East	AllTeck Limited Partnership, Jade Transport, South Floral Siding, Procon Mining Saskatoon, MGM Seed & Grain Ltd
South	South Floral Siding, Agricultural Land, Highway 16
West	Agar Road, Farm Credit Canada, 4D Transport



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## 3.0

## RECORDS REVIEW

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### 3.1. AERIAL PHOTOGRAPHS

Six aerial photographs from 1974 to 2021 were used for evaluating historical and current land usage of the Subject Property and surrounding area.

Copies of the aerial photographs are presented in Appendix C.

#### 3.1.1. 1974 Photograph

The Subject Property, and neighbouring properties located directly east, south, and west of the Subject Property are occupied by agricultural land.

A roadway, currently Township Road 360, is located directly north of the Subject Property. Further north, agricultural land and a rail line are present. What appears to be a homestead is visible northeast of the Subject Property, on the northside of Township Road 360.

In the distant area east of the Subject Property, a large industrial building associated with a structure northwest of the large building, a structure south of the large building, and silos located northeast of the large building are visible. The structures and silos appear to be connected to the industrial building via chutes. A small building is visible north of the industrial building.

In the distant area south and west of the Subject Property, a roadway, presently Highway 16, is visible.

#### 3.1.2. 1986 Photograph

The Subject Property, and neighbouring properties located east, and west of the Subject Property appear to be similar to the 1974 photograph.

The 1986 photograph does not include the properties located on the north side of Township Road 360, north of the Subject Property.

#### 3.1.3. 1997 Photograph

The Subject Property is occupied by two buildings and a storage yard. A large industrial building is visible in the north central region of the Subject Property and a building with a similar configuration to the current structure is visible southwest of the



industrial building. What appears to be a vertical tank and a liquid holding cell, is visible east of the central region of the industrial building. Material storage is visible throughout the yard, north and south of the buildings. What appears to be a slough enclosed by a fence is visible in the northeast corner of the Subject Property.

The neighbouring properties located south and west of the Subject Property appear to be similar to the 1986 photograph.

The properties located north of the Subject Property appear similar to the 1974 photograph. It is unknown if a homestead is still visible on the property located northeast of the Subject Property, as it is not included in the 1986 photograph.

The industrial property located in the distant area east of the Subject Property is not included in the 1986 drawing, however a hard copy of the photograph was interpreted. The industrial property appears similar to the 1986 photograph.

#### **3.1.4. 2002 Photograph (Poor Image)**

The Subject Property, and neighbouring properties located east, south, and west of the Subject Property appear to be similar to the 1997 photograph.

The homestead visible northeast of the Subject Property appears to have fewer outbuildings present than the 1974 photograph.

Additional developments are visible in the distant area northwest and southeast of the Subject Property.

#### **3.1.5. 2007 Photograph (Poor Image)**

The Subject Property, and neighbouring properties located north, east, and west of the Subject Property appear to be similar to the 2002 photograph.

#### **3.1.6. 2015 Photograph (Poor Image)**

The large industrial building that once occupied the north central region of the Subject Property is no longer visible. What appears to be the former building footprint is visible. Due to the poor image quality, it is unknown if the vertical storage tank and liquid holding cell remain on the Subject Property.

The neighbouring properties located north of the Subject Property appear to be similar to the 2007 photograph.



Two buildings and a storage compound are visible on the property directly east of the Subject Property. What appears to be material storage is visible throughout the property. Vacant land is visible south of the buildings and storage compound, located directly east of the Subject Property. Further east, a roadway, presently South Floral Siding, is present.

What appears to be a slough is visible directly south of the Subject Property. Further south, what appears to be a continuation of the South Floral Siding road is visible.

A vacant lot is present directly west of the Subject Property. What appear to be trailers are visible on the property.

The large industrial building with chutes associated with it is no longer visible in the distant area east of the Subject Property. What appears to be two commercial properties are visible.

### **3.2. PROPERTY USE RECORDS**

#### **3.2.1. Fire Insurance Plans**

Historical fire insurance plans are maps of urban areas that may provide information such as the location of aboveground fuel storage tanks (ASTs) and underground fuel storage tanks (USTs), and building/occupancy information. Fire insurance maps are generally available for major cities.

Fire Insurance Plans (FIPs) were not published for the RM of Corman Park.

#### **3.2.2. Henderson Directories**

Henderson/Polk Directories provide information on the historical tenants in many cities and some town properties. Directories are available from 1905 through 2000.

Henderson/Polk Directories were not published for the RM of Corman Park.

### **3.3. LAND TITLES**

101046965 Saskatchewan Ltd. has been listed as the owner of the Subject Property since 08 September 2020. Previous owners include Affiliated Properties Inc., Bart Zimmer Realty Inc., LaFarge Canada Inc., Canada Cement LaFarge Ltd., Canada Cement Company Limited., Her Majesty the Queen and to the Use of Her Province of Saskatchewan, and Montreal Trust Company.



Table 1, Appendix D presents a summary of the land titles. Appendix E presents copies of the land titles from the past 62 years for the Subject Property.

### **3.4. COMPANY RECORDS**

The CLIENT provided two previous Phase II ESA reports to PINTER. A Phase II ESA was completed in 2009 by P.Machibroda Engineering Ltd. and PINTER completed a Phase II ESA in 2014.

### **3.5. PREVIOUS PHASE II ENVIRONMENTAL REPORTS**

A Phase II ESA was completed in 2009 by P.Machibroda Engineering Ltd. The report included the following information:

- The Subject Property contained an aboveground storage tank containing resin (AROPOL K 1828 RESIN) used to make fiberglass tanks.
- In 2008, the AST reportedly overflowed allowing some of the resin to enter an adjacent concrete water storage pit. The water in the pit was then reportedly pumped out and released onto the adjacent (off-site) property to the west.
- The Phase II ESA was required to address an Environmental Protection Order issued by the Saskatchewan Ministry of Environment following the discharge of the water in the concrete pit.
- The Phase II ESA included an investigation on the Subject Property and the adjacent property to the west to determine if they had been adversely impacted by the release, specifically investigating metals and Volatile Organic Compounds (VOCs).
- Results indicated that the soil in the area of investigation had not been adversely impacted by the releases (if any) of metals and/or VOCs associated with the (resin) AST.
- The concentration of VOCs measured from the groundwater samples collected were below the Agricultural Groundwater Criteria and laboratory detection limits. Dissolved arsenic, selenium, and uranium measured in the water samples collected in two wells were slightly above the Agricultural Groundwater Criteria. It was concluded that these concentrations were due to



sampling methods since these parameters were not found in the resin used at the Site.

A Phase II ESA was completed in 2014 by PINTER. The report included the following information:

- A Phase II ESA was required to address concerns related to historical incidents on the property.
- The historical incidents included the unauthorized release of liquids off-site to the west in July 2008, the burning of fiberglass on the property in April 2009, and the manufacturing facility burning down in December 2009.
- Shallow soil samples were collected on the Site and analyzed for benzene, toluene, ethylbenzene, xylenes (BTEX), styrene and phenols. BTEX, styrene, and phenols were selected for analysis due to their common presence as a byproduct of fiberglass being burned.
- Laboratory analytical results for soil contained concentrations of BTEX that were below the applicable Saskatchewan Ministry of Environment (SMOE) 2014 guidelines.
- Laboratory analytical results for soil contained concentrations of styrene and phenols that were below the applicable SMOE 2014 guidelines.
- It was concluded that no further work was required.

Note: A letter from the Ministry of Environment, dated 06 November 2014, was included in the scanned documents provided to PINTER. The letter was addressing the Phase II ESA completed by PINTER in October 2014. The letter stated that based on the information provided, the site was deemed to be compliant with provincial environmental standards in place at the time.

Appendix F presents copies of the previous Phase II ESA reports.

### **3.6. THE RM OF CORMAN PARK**

A file search was requested on 10 February 2022 through the RM of Corman Park.

A response has not been received at the time of this report.



### 3.7. GEOLOGICAL AND GEOTECHNICAL REPORTS

Borehole logs were included in the Phase II ESA completed by P.Machibroda. The stratigraphy on the Subject Property consisted of fill and/or sand and gravel extending to approximately 1.3 m bgs. The surficial deposits were underlain by silt and/or clay extending to depth ranging from approximately 2.7 m bgs to 6.1 m bgs. The above deposits were underlain by glacial till extending to a depth of at least 7.5 m bgs, the maximum depth to which boreholes were advanced on the Subject Property.

### 3.8. REGULATORY INFORMATION

#### 3.8.1. Hazardous Materials Storage and Registered Spills Database

A search of the Saskatchewan Ministry of Environment (SMOE) Hazardous Materials Storage and Spills Database, using land location and key words, found one record of a hazardous materials storage facility on the Subject Property.

- FRP Manufacturing INC. Storage Site, Operation ID#7091. The storage site is listed as ‘Operating’.

No hazardous materials storage facilities registered with the SMOE were identified within 150 m of the Subject Property.

Eight spills registered with the SMOE were identified within an unknown radius of the Subject Property. Due to the unknown location of the spills, there is a potential for them to be within 150 m of the Subject Property.

- 400 litres (L) of Sulfuric Acid was spilled on 19 November 2004, the spill ID is unknown, the address listed is Clavet.
- 212 kilograms (kg) of ‘Other-Liquid Fertilizer’ was spilled on 20 April 2006, Spill ID#60126, the address listed is Clavet.
- 1,000 kg of ‘Ammonia-2800 UAW URUA Ammonia Nitrate Liquid Fertilizer’ was spilled 15 May 2006, Spill ID#60165, the address listed is Clavet.
- 100 L of ‘Other-Round up credit-no hazard weed spray’ was spilled on 17 September 2007, Spill ID#70505, the address listed is Clavet.
- 27,250 L of ‘Potassium-Potash Bribe 7200 Gallons’, was spilled on 18 November 2008, Spill ID#80503, the address listed is Clavet.
- 0 L of ‘Oil & Grease-Unknown Amount of Oil’, was spilled on 23 September 2010, Spill ID#100466, the address listed is Clavet.



- 454.25 L of Diesel Fuel LIQ was spilled on 28 April 2014, Spill ID#140248, the address listed is Clavet.
- 420,000 L of Oil & Grease was spilled on 07 July 2015, Spill ID#15230, the address listed is Clavet.

A summary of the SMOE database search results is provided in Table 2 and Table 3, Appendix D, and the results of the SMOE database search are provided in Appendix G.

### **3.8.2. Government of Saskatchewan Correspondence**

The Subject Property is currently in the subdivision application process. Through this process, a Government of Saskatchewan Planning Consultant, Damon Widynowski, has provided PINTER personnel, and the Subject Property owners, with the Ministry of Environment's response regarding the subdivision application on 08 February 2022. The following information was provided:

*'No spills have been recorded in the area, however there are three hazardous substance storage facilities in proximity. The Ministry of Environment recommends having an Environmental Site Assessment completed if there are concerns with the proximity of these storage facilities to the proposed subdivision. The Ministry also advises environmentally sensitive activities may require a review or permit. These activities include, but are not limited to: storage of hazardous materials; industrial or commercial processed that may create air pollution, liquid or solid waste; or the generation or storage of industrial waste.'*

### **3.9. GEOLOGICAL AND SOIL MAPS**

The Site is located within the Bradwell Soil Association. The Bradwell Association consists of a group of Chernozemic Dark Brown soils formed under a grassland vegetation (Acton, et al., 1978). These soils have formed in medium to moderately fine textured, moderately calcareous, sandy glacio-lacustrine deposits and occur primarily on nearly level and undulating landscapes (Acton, et al., 1978).

The parent material of the Bradwell soils is a pale olive coloured deposit in which loam, fine and very sandy loam textures predominate with clay loam, fine and very fine sandy clay loam textures occurring less frequently (Acton, et al., 1978). These deposits are moderately calcareous and generally low in salinity, although in some local, low lying areas the salinity may be moderately high (Acton, et al., 1978).



The surface textures of the Bradwell Association vary somewhat, with nearly level and undulating, knoll and depression lacustrine plains being most common (Acton, et al., 1978).

### **3.9.1. Hydrogeology and Groundwater**

A water well search was conducted on 09 February 2022 by reviewing the Saskatchewan Water Security Agency (WSA) online water well database (WSA, 2022). The search includes all registered groundwater wells and test holes potentially located within 1,000 m of the Subject Property; however, all well records may not be included in the database. The current status of the registered wells was not field-verified under the scope of this investigation.

A total of seven (7) water well records were identified within the search area. The wells were listed as domestic withdrawal use. The known date of completion ranged from 1935 to 2015. The water well completion depths ranged from 6.7 m bgs to 97.5 m bgs, and the static water level depths ranged from 3.0 m bgs to 6.1 m bgs. Appendix H presents copies of the water well driller reports.

### **3.10. TOPOGRAPHIC MAPS**

A review of a topographic map of the area (topographic-map.com) indicates that the Subject Property is at an approximate elevation of 521 m asl. The area surrounding the Subject Property has a gradual downward slope south, away from the Subject Property.



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## 4.0

## SITE VISIT

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The site visit was completed by Annette Bellinger of PINTER on 14 February 2022. Dan Beaulac, Subject Property owner and Steven James of Quantum Genetix, provided site access. Observations of adjoining and neighbouring properties were made from the Subject Property and publicly-accessible locations. The observations herein are applicable for the date of the site visit only and should not be relied upon to represent conditions at other times. Select photographs taken during the site visit are included in Appendix I.

### 4.1. ACCESS LIMITATIONS

All areas of the Subject Property were accessible, except the roof of the building, RV trailers, and the storage sea cans.

### 4.2. PROPERTY USE

The Subject Property consists of a commercial building with a storage yard. The Subject Property is currently occupied by Quantum Genetix, a Polymerase Chain Reaction (PCR) testing facility.

### 4.3. HAZARDOUS MATERIALS

Small quantities of household cleaners, paint cans, paint pails, and commercial alcohols were observed in the storage closet, laboratory, and vacant offices in the Subject Property building. Household cleaner containers, approximately 3.78 L in volume, were observed in the storage closet (Photo 1) and laboratory room of the building, situated on metal shelving units. Paint cans (ranging from approximately 0.931 L to 3.8 L in volume) were observed in the vacant office space, situated on the concrete surface (Photo 2), and in the storage room situated on a metal shelf. Multiple 20 L pails of paint were observed in the vacant office space, situated on the concrete surface (Photo 3). Empty and full containers of commercial-grade alcohol containers, ranging from 3.78 L to 4 L were observed on cardboard boxes within one of the laboratory rooms (Photo 4).

### 4.4. UNIDENTIFIED SUBSTANCES

Unidentified materials were not observed on the Subject Property.



#### **4.5. STORAGE TANKS**

Storage tanks were not observed on the Subject Property.

#### **4.6. STORAGE CONTAINERS**

Storage containers were not observed on the Subject Property.

#### **4.7. ODOURS**

Strong, pungent, or noxious odours were not observed on the Subject Property.

#### **4.8. POTABLE WATER SUPPLY**

The Subject Property is provided with potable water by a water tank through SaskWater.

#### **4.9. BUILDING DETAILS**

The Subject Property building consists of a single-storey building constructed over a slab-on-grade concrete foundation. The building consists of a reception area, individual office spaces, washrooms, a boardroom, kitchen, laboratory rooms, and a mezzanine.

##### **4.9.1. Interior Observations**

The building on the Subject Property is used as an office and laboratory facility. An open reception area with a desk occupies the western portion of the Subject Property building. Multiple individual office spaces, a boardroom, and laboratory rooms occupy the north, east, south, and west portions of the building. The laboratory rooms are equipped with fume hoods.

A furnace room was observed in the northern portion of the building. A kitchen was observed along the southern wall of the building. A mezzanine, and another reception area occupy the eastern portion of the building. Two doors in the central region of the building allow for access to an outside courtyard.

**TABLE B –Details Summary**

Type:	Single-storey building
Year of Construction:	1990s
Footprint area:	Approximately 814 m <sup>2</sup>
Foundation:	Concrete
Exterior Walls:	Stucco, stone
Interior Walls:	Drywall
Insulation:	Unknown
Roof:	Asphalt shingles
Flooring:	Concrete, carpet
Ceiling:	Open ceiling, suspended ceiling tiles

#### **4.9.2. Heating and Cooling Systems**

The Subject Property is provided heat through natural gas-fire boiler, in floor heat, and radiator heating coils. Cooling is provided through an air-conditioning unit located along the northern exterior wall of the Subject Property.

#### **4.9.3. Stains**

Stains were not observed in the Subject Property building.

#### **4.9.4. Drains and Sumps**

Drains were observed in the washrooms of the Subject Property (Photo 5).

#### **4.9.5. Mechanical Equipment**

Mechanical equipment was not observed in the Subject Property building.

### **4.10. EXTERIOR OBSERVATIONS**

#### **4.10.1. General**

The Subject Property is occupied by an office building. The Subject Property is enclosed by a chain-link fence. RV trailers were observed on the northern portion of the Subject Property. A transformer, air-conditioning unit, and an old natural gas line were observed near the north exterior wall of the building. The transformer was observed in a containment box. Two storage sea cans were observed directly east of the Subject Property building. Undeveloped land occupies the southern portion of the Subject Property. A septic tank was observed southwest of the building, covered by snow. A parking lot occupies the western region of the Subject Property. Two waste disposal bins were situated along the western fence line.



#### **4.10.2. Adjoining and Neighbouring Properties**

Township Road 360 is located north of the Subject Property. Further north, undeveloped land, and a rail line are present.

Allteck Limited and Jade Transport are located east of the Subject Property. Further east, South Floral Siding Road, MGM Seed & Grain Ltd., and Procon Mining Saskatoon are present.

South Floral Road and agricultural land is located south of the Subject Property. Further south, Highway 16 is present.

Agar Road is located west of the Subject Property. Further west, 4D Transport and Farm Credit Canada are present.

#### **4.10.3. Topographic, Geologic, and Hydrogeological Conditions**

The grade of the Subject Property is relatively flat.

#### **4.10.4. Wells**

Wells were not observed on the Subject Property.

#### **4.10.5. Sewage Disposal**

Sewage generated on the Subject Property flows into a septic tank located southwest of the Subject Property building.

#### **4.10.6. Pits and Lagoons**

Pits and lagoons were not observed on the Subject Property.

#### **4.10.7. Stained Materials**

Stains were not observed on the Subject Property. Snow cover prevented inspection of the majority of the exterior ground surface.

#### **4.10.8. Stressed Vegetation**

No vegetation was observed on the Subject Property due to the snow cover.

#### **4.10.9. Fill**

Fill was not observed on the Subject Property.



**4.10.10. Wastewater**

Wastewater is not generated on the Subject Property.

**4.10.11. Watercourses, Ditches, or Standing Water**

Watercourses, ditches or standing water were not observed on the Subject Property.

**4.10.12. Roads, Parking Facilities, and Rights of Way**

Township Road 360 is located directly north of the Subject Property. South Floral Siding Road is located directly south of the Subject Property. Agar Road is located directly west of the Subject Property.

**4.11. SPECIAL ATTENTION ITEMS**

**4.11.1. Asbestos**

Materials that potentially contain asbestos were not observed during the assessment.

**4.11.2. Lead**

Materials that potentially contain lead were not observed during the assessment.

**4.11.3. Mercury**

Older model thermostats and light bulbs that are potentially fluorescent were observed in the Subject Property building.

**4.11.4. Ozone-Depleting Substances (ODS)**

Fire extinguishers (Photo 6), and multiple refrigeration units (Photo 7), and an air-conditioning unit were observed on the Subject Property and may contain ozone-depleting substances (ODS).

**4.11.5. Urea Foam Formaldehyde Insulation (UFFI)**

Evidence of retrofit insulation was not observed on the Subject Property.

**4.11.6. Mould and Moisture**

Watermarks were observed throughout the Subject Property building along the suspended ceiling tile. Water marks were observed in the boardroom (Photo 8), kitchen (Photo 9), and laboratory.

**4.11.7. Polychlorinated Biphenyls (PCBs)**

A transformer was observed in a containment box near the northern exterior wall of the Subject Property building (Photo 10).



**4.11.8. Radon**

Background conditions for radon in the area were not measured.

**4.11.9. Electric and Magnetic Fields**

Sources of electric and magnetic fields were not observed.

**4.11.10. Vibration**

Major sources of vibration were not identified.

**4.11.11. Cemeteries**

Cemeteries were not observed in the vicinity of the Subject Property.



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## 5.0

## INTERVIEWS

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Interviews were conducted on 09 February 2022 via email, 14 February 2022 in person, and 25 February 22 via phone and email.

### **Dan Beaulac, Subject Property Owner**

Dan indicated that:

- Quantum Genetix has occupied the Subject Property for 4 years.
- The current Subject Property building has always been an office.
- An office building has been on the Subject Property for over 20 years.
- The Subject Property previously had a bulk storage permit approximately 12 years ago.
- An aboveground tank, approximately 25,000 gallons (approximately 94,635 L) that contained resins was previously located on the Subject Property. The tank was approximately 5 years old before being removed from the Subject Property.
- An old natural gas line is located north of the building.
- A transformer used for power for the property is enclosed in a wooden storage unit along the northern exterior wall of the building.
- The Subject Property uses a drip system for water.
- The building is provided heat through a boiler and radiator heating coils. Cooling is provided through forced air.
- The on-site transformer is approximately 20 years old. The base of the containment box is fiberglass. To his knowledge, there have been no known spills or leaks associated with the transformer.
- The historical liquid holding cell that was observed in historical photographs was a concrete loading dock that was filled with water. The loading dock is filled with soil and is no longer in use on the Subject Property.
- To his knowledge, there have been no known spills or leaks on the neighbouring properties. There was a potential spill on the Subject Property many years ago and a Phase II ESA was completed.
- To his knowledge, there have been no environmental concerns with the Subject Property or neighbouring properties.

### **Steven James, Quantum Genetix Research Director**

Steven indicated that:

- There are no ASTs or USTs currently on the Subject Property.
- There is a fertilizer chemical plant northwest of the Subject Property.



- The water marks in the kitchen were due to the air handler condensing. The air handler is currently fixed.
- To his knowledge, there have been no known spills or leaks on the Subject Property, or neighbouring properties.
- To his knowledge, there have been no environmental concerns with the Subject Property, or neighbouring properties.



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## 6.0 EVALUATION

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There are generally two types of contamination that are considered in assessing a property. The first would be actual or potential on-site contamination caused by spills, releases, or practices that have directly impacted the Subject Property. The second type is actual or potential off-site contamination which may be caused by spills, releases, or practices on neighbouring properties that could migrate through the soil and groundwater to the Subject Property. The two types of contamination, as well as several environmental management considerations, are discussed in the following sections.

### 6.1. ACTUAL ON-SITE CONTAMINATION

#### 6.1.1. Historical Resin Spill

Historical evidence indicated that in 2008, the aboveground storage tank containing resin, overflowed allowing some resin to enter an adjacent concrete water storage pit. The pit was then pumped out and released onto the adjacent (off-site) property to the west. Historical Phase II ESAs have been completed on the Subject Property, summarized in Section 3.5, above. The Subject Property and adjacent property were assessed, and it was determined that samples collected on the properties did not contain contaminant concentrations that exceeded the applicable environmental criteria in place at the time of the work.

It is unlikely that the historical resin spill has impacted the overall condition of the Subject Property.

### 6.2. POTENTIAL ON-SITE CONTAMINATION

#### 6.2.1. FRP Manufacturing Inc. Storage Site, Subject Property

The Subject Property was listed as an operating hazardous materials facility with the SMOE. Interview evidence indicated that the Subject Property contained a 25,0000 gallon (approximately 94,635 L) aboveground storage tank containing resin. Interview evidence indicated that there are currently no ASTs or USTs on the Subject Property and that the owners obtained a bulk storage permit 12 years ago for a historical AST. Observations made during the site visit confirmed that no ASTs are located on the Subject Property and no visual indications of potential USTs (i.e., vent lines) were observed.



Two historical Phase II ESAs were completed on the Subject Property, one in 2009 and one in 2014. The reports are summarized in Section 3.5., above. The 2009 Phase II ESA concluded that the soil in the area of investigation has not been adversely impacted by chemicals associated with the resin AST and it was determined that groundwater concentrations were attributable to background concentrations. The Phase II ESA completed in 2014 evaluated all historical incidents on the Subject Property and concluded that no further work was required.

Based on interview evidence and the historical Phase II ESA reports, it is unlikely that historical activities have impacted the overall condition of the current Subject Property.

### **6.2.2. Historical Fires**

The review of the historical environmental report, specifically the report completed by PINTER in 2014, identified that two fires had historically occurred on the Subject Property. The burning of fiberglass on the Subject Property was noted in April 2009 and the historical manufacturing facility located on the Subject Property burned down in December 2009. The environmental work in 2014 was completed to address the potential impacts on the Subject Property due to the historical fires. The environmental work determined that the overall condition of the Subject property had not been adversely affected by the fires. The Ministry of Environment accepted the Phase II ESA completed in 2014 (also referred to as a Closure Report) and concluded that the Subject Property was deemed to be compliant with the provincial environmental standards in place at the time of the environmental work.

### **6.2.3. Hazardous Materials**

Small quantities of household cleaners, paint cans, paint pails, and commercial alcohols were observed in the storage closet, laboratory, and a spare office space of the building of the Subject Property. The surfaces on which these materials were stored appeared to be in good condition. When properly sealed and stored, these products pose little risk to the environment. The assessment did not identify any evidence of significant spills or leaks; therefore, the storage of these materials is not thought to have impacted the overall condition of the Subject Property.

### **6.2.4. On-Site Transformer**

An on-site transformer was observed in a wooden containment box near the northern exterior wall of the Subject Property building. Interview evidence indicated that the transformer is approximately 20 years old. Interview evidence also indicated that the



base of the containment box is fiberglass. Evidence of leaks or spills could not be identified due to the snow-covered ground surface. Transformers can be a potential source of contamination, should spills or leaks occur. However, the contaminants associated with transformers (PCBs, heavy fraction petroleum hydrocarbons, and metals) are relatively immobile in the soil and thus, do not migrate far from the source. Therefore, it is unlikely that the presence of the on-site transformer will affect the overall condition of the Subject Property.

#### **6.2.5. Historical Holding Cell**

A historical holding cell was located east of the former industrial building located on the Subject Property. The holding cell was first observed in an aerial photograph from 1997. No visual indication of a holding cell was observed during the Site visit. Holding cells can be a potential environmental concern depending on the liquid stored in them and their contents. Interview evidence indicates that the holding cell area was used as a loading dock. Additionally, the cell is concrete lined and has been filled with soil. Due to the on-site observations and interview evidence, it is unlikely that the overall condition of the Subject Property has been affected by the historical holding cell.

### **6.3. POTENTIAL ENVIRONMENTAL MANAGEMENT ISSUES**

The presence, or potential presence, of special attention items is not necessarily an indication of actual or potential contamination. However, if not properly managed, special attention items could lead to contamination.

#### **6.3.1. Mercury**

Mercury is a naturally-occurring element that can exist in multiple forms. It is used in many products due to its liquid and metallic properties. It is commonly found in gravity switches (automobile parts), electrical switches (analogue thermostats), fluorescent light bulbs, and in some metal halide light bulbs. Older model thermostats and potentially fluorescent lightbulbs were observed in the Subject Property building. These may contain mercury. Mercury-containing materials should be disposed of at a facility designed to accept this type of waste.

#### **6.3.2. Ozone-Depleting Substances (ODS)**

Ozone-depleting substances (ODS) generally contain chlorine, fluorine, bromine, carbon, and hydrogen in varying proportions and are often described by the general term halocarbons. Chlorofluorocarbons (CFCs), carbon tetrachloride, and methyl



chloroform are important human-produced ozone-depleting gases that have been used in many applications including refrigeration, air conditioning, foam blowing, cleaning of electronics components, and as solvents. Another important group of human-produced halocarbons is the halons, which contain carbon, bromine, fluorine, and (in some cases) chlorine and have been mainly used as fire extinguishers.

### **6.3.3. Mould and Moisture**

Water staining was observed on the suspended ceiling tiles of the Subject Property building. Moist building materials provide a suitable habitat for mould and fungi. The source of the water should be identified and repaired, and moisture-affected materials should be replaced or cleaned using a disinfectant solution.

## **6.4. ACTUAL OFF-SITE CONTAMINATION**

### **6.4.1. Registered Spill Reports**

Eight spill reports for unknown locations (all addresses listed as ‘Clavet’) and distances from the Subject Property were found during the assessment. The spilled materials included sulfuric acid, fertilizer, oil and grease, and diesel liquid. Spill volumes ranged in quantities. No evidence that the spills registered to ‘Clavet’ occurred on the Subject Property or adjoining properties was found during the assessment. In addition, spills reported to the MOE are typically assessed and cleaned up under regulatory guidance. It is therefore unlikely that the overall condition of the Subject Property has been affected by the registered spills.

### **6.4.2. Historical Resin Spill**

The historical resin spill discussed in Section 6.1.1., above, occurred on the Subject Property, however a mixture of the spill and water was reported to be discharged onto the property located west of the Subject Property. In conjunction with the historical environmental work completed on the Subject Property, the potential off-site impacts were addressed. Based to the historical environmental work completed on the property west of the Subject Property, it is unlikely that the current overall condition of the Subject Property has been affected.

## **6.5. POTENTIAL OFF-SITE CONTAMINATION**

### **6.5.1. Hazardous Substance Storage Facilities**

Information through correspondence with the Government of Saskatchewan during the subdivision application process indicated that there are *‘three hazardous substance*



*storage facilities in proximity*'. Through the SMOE searches PINTER personnel conducted, using a 150 m radius from the Subject Property, only one hazardous substance storage facility was identified. The single hazardous substance storage facility identified was found to be located on the Subject Property and is discussed in Section 6.2.1., above. It is unknown what distance the Saskatchewan Ministry of Environment used regarding additional hazardous storage facilities being located in the vicinity of the Subject Property. Based on the 150 m search radius implemented for the assessment, the two unknown facilities are not a concern for the overall condition of the Subject Property.



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## 7.0

## CONCLUSIONS

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Our assessment did not identify evidence of actual or potential on-site contamination that could affect the overall condition of the Subject Property. There is no evidence of actual off-site contamination or potential off-site impacts that could travel to the Subject Property.

We note that the following special attention items may be present in the Subject Property building and will require proper management and disposal if renovation or demolition occurs, affecting these materials: the on-site transformer may contain PCBs, fire extinguishers and refrigeration units may contain ozone-depleting substances (ODS), fluorescent light bulbs and older model thermostats likely contain mercury, and moisture-affected building materials were also observed within the Subject Property building.

No further environmental assessment work is recommended for the Subject Property.



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## **8.0 ASSESSOR QUALIFICATIONS**

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This report was prepared by Annette Bellinger, Cassidy Salik, and Jessica Cutter of PINTER & Associates Ltd. Annette Bellinger is an Articling Agrologist working towards her professional designation. Cassidy Salik is an Engineer-in-Training and has over two years of experience completing Phase I ESAs and impacted site assessment work. Jessica Cutter is an environmental toxicologist with over 8 years of experience in completing and reviewing environmental site assessments, managing contaminated sites, and working on remediation projects. Jessica Cutter has been designated as a Qualified Person by the Saskatchewan Ministry of Environment.



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## 9.0

## REFERENCES

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- Saskatoon Topographic Map. 2022. Available at <https://en-ca.topographic-map.com/maps/f5t5/Saskatoon/> [accessed: February 2021].



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## 10.0 LIMITATIONS

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In conducting this investigation on the Subject Property, and in rendering our findings and conclusions on the presence and/or level of actual and potential contamination, PINTER gives the benefit of its best judgment based on its experience and in accordance with generally accepted professional standards for this type of assessment. Our conclusions are limited by the following considerations:

- The scope of work requested to be undertaken.
- The scope of work for the Phase I ESA was non-intrusive. No samples of soil, groundwater or building materials were collected for laboratory analysis.
- Snow cover limited the visual observation of the ground surface.

PINTER has relied in good faith on information provided by the interviewees. We accept no responsibility for any deficiencies or inaccuracies contained in this report resulting from omissions, misinterpretations or fraudulent acts of the persons interviewed. Our conclusions are drawn from the information provided to PINTER, in whole or in part, during the course of this environmental site investigation and have been included in this report.

No environmental site assessment can wholly eliminate uncertainty regarding the potential for recognized environmental conditions in connection with a property. Performance of a standardized environmental site assessment is intended to reduce, but not wholly eliminate, uncertainty regarding the potential for recognized environmental conditions in connection with the property, given reasonable limits of time and cost.

PINTER will not be responsible or held liable for any existing contamination or adverse impacts on the study area that have not been caused by its activities. Actions at the Site without PINTER's knowledge may influence the environmental status of the property. No warranty, expressed or implied, is given concerning the current environmental condition of the Site following the submission of this report dated 02 March 2022.

This report has been prepared for the exclusive use of 101046965 Saskatchewan Ltd. Any use that a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties.



PINTER & Associates Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

**PINTER & Associates Ltd.**

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Annette Bellinger, B.Sc., Ag., AAgr.  
Environmental Scientist

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Cassidy Salik, B.Sc., E., E.I.T.  
Engineer-in-Training

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Jessica Cutter, M.Sc.  
Project Manager

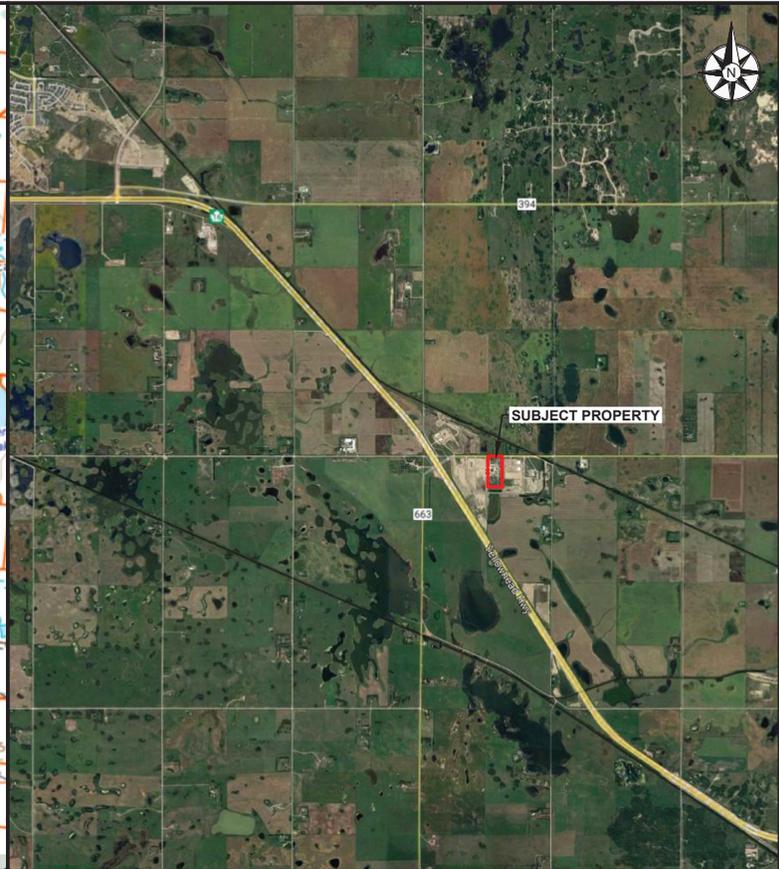
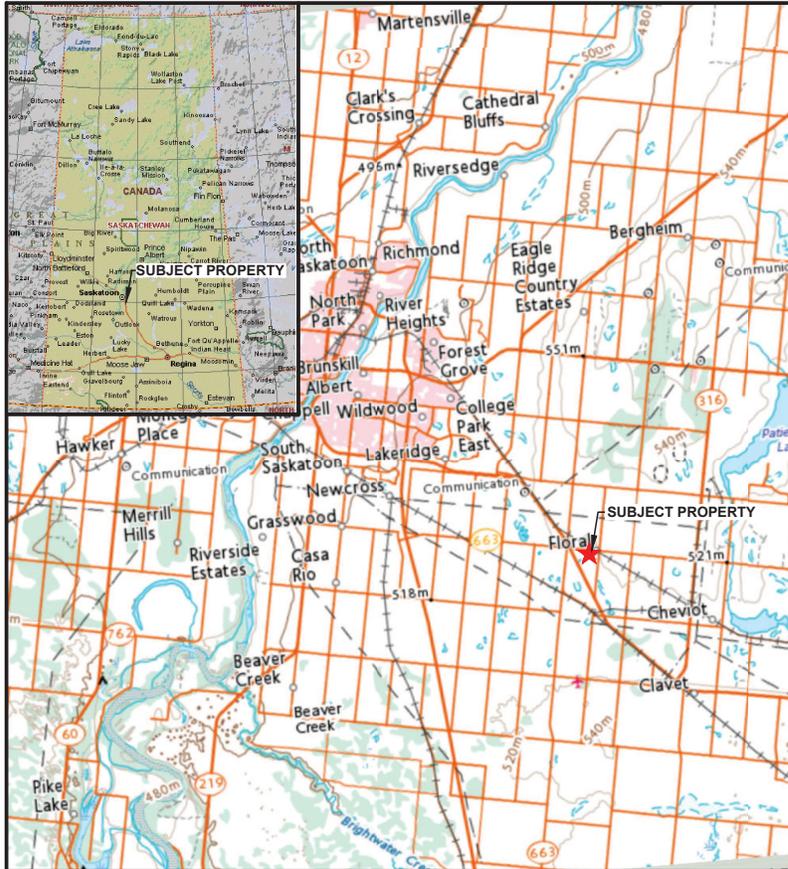
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Date: 02 March 2022

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ph i esa 02mar22 final.docx

# **Appendix A**

## **Figures**



710A-48TH STREET EAST  
SASKATOON SK S7K 0S6  
306.24.1710  
pintermail@pinter.ca

- NOTES:**
1. IMAGE SOURCE FROM GOOGLE EARTH 2020  
IMAGE DATED 2015 (ACCESSED FEBRUARY 2022).
  2. MAP FROM NATURAL RESOURCES CANADA  
GEOGRATIS.
  3. THIS DRAWING IS PREPARED FOR ILLUSTRATIVE  
PURPOSES ONLY.

**LEGEND**  
SUBJECT PROPERTY - APPROXIMATE LOCATION



**FIGURE 1**  
SUBJECT PROPERTY LOCATION

22 FEBRUARY 2022  
28B0-1 - PHASE I ESA, PARCEL B AND PARCEL C  
OF NE-35-35-04-W3M, RM OF CORMAN PARK, SK.  
DRAWN BY: NA  
CHECKED BY: JC

NOT TO SCALE  
FILE: P101-PROJ-075-2020-F100M - SUBDIVISION DEVELOPMENT  
CORP-080-1 - PHASE I ESA-080-1 DRAWINGS



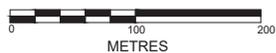
Image Source from Google Earth 2022, Image dated 2015 (Accessed February 2020)



710A-48TH STREET EAST  
SASKATOON SK S7K 5B4  
306.244.1710  
pintermain@pinter.ca

**LEGEND**

SUBJECT PROPERTY - APPROXIMATE LOCATION - - - - -



SCALE: 1: 6000

FILE: H:\2) PROJECTS\ 2880 FLORAL SUBDIVISION DEVELOPMENT  
CDR\2880-1 PHASE I ESA\2880-1 DRAWINGS

DRAWING TITLE:

**FIGURE 2**  
ADJACENT LAND USE

DATE: 22 FEBRUARY 2022

PROJECT: 2880-1 - PHASE I ESA, PARCEL B AND PARCEL C  
OF NE-35-35-04-W3M, RM OF CORMAN PARK, SK.

DRAWN BY: NA

CHECKED BY: JC

**Appendix B**  
**Zoning**

**SCHEDULE J - M 1 - LIGHT INDUSTRIAL DISTRICT**

***(Bylaw 13/17, Approved September 28, 2017)***

1. **THE INTENT OF THE M 1 DISTRICT SHALL BE:**

To accommodate industrial uses and activities such as manufacturing, processing, assembly, repair and end user production and distribution. Activities within this District typically have minimal servicing and limited storage of raw inputs. Any nuisance associated with uses within the Light Industrial District (M 1) should generally not extend beyond the boundaries of the site.

2. **THE USES IN THE M 1 DISTRICT SHALL BE:**

In any Light Industrial District, no person shall use any land, building or structure or erect any building or structure except in accordance with the following provisions:

2.1 **THE PRINCIPAL PERMITTED USES SHALL BE:**

- a) Abattoir
- b) Aggregate Resource Storage and Processing Operation
- c) Agricultural Support Service
- d) Animal Crematorium
- e) Brewery
- f) Bulk Fuel Sales & Storage
- g) Business Support Service
- h) Cannabis Micro Production Facility (***Bylaw 65/20, Approved February 11, 2021***)
- i) Cannabis Processing Facility (***Bylaw 60/18, Approved February 21, 2019***)
- j) Cannabis Production Facility (***Bylaw 60/18, Approved February 21, 2019***)
- k) Cannabis Research & Testing Facility (***Bylaw 60/18, Approved February 21, 2019***)
- l) Cannabis Wholesaler (***Bylaw 60/18, Approved February 21, 2019***)
- m) Clean Fill Storage Operation (***Bylaw 52/21, Approved January 12, 2022***)
- n) Commercial Storage Centre
- o) Crematorium
- p) Distillery
- q) Equipment Sales and Rental
- r) Gas Bar
- s) Industrial Complex, One Building (***Bylaw 48/20, Approved November 9, 2020***)
- t) Levelling, Filling and Grading Type I (***Bylaw 52/21, Approved January 12, 2022***)
- u) Manufacturing Establishment
- v) Municipal Facility
- w) Pet Care Facility
- x) Public Utility
- y) Research Laboratory
- z) Recreational Vehicle Sales/Rentals
- aa) Service Station
- bb) Solar Farm (***Bylaw 61/18, Approved February 21, 2019***)
- cc) Telecommunications Facility

- dd) Vehicle Repair Shop
- ee) Vehicle Sales/Rentals
- ff) Vehicle/Equipment Wash
- gg) Veterinary Clinic
- hh) Warehousing
- ii) Warehouse Sales
- jj) Wholesale Trade

2.2 THE DISCRETIONARY USES SHALL BE:

- a) Animal Kennel
- b) Auction Facility
- c) Cannabis Retail Store (*Bylaw 60/18, Approved February 21, 2019*)
- d) Construction Yard
- e) Industrial Complex, Multiple Buildings (*Bylaw 48/20, Approved November 9, 2020*)
- f) Landscaping Service
- g) Levelling, Filling and Grading Type II (*Bylaw 52/21, Approved January 12, 2022*)
- h) Local Waste Management and Remediation Industry
- i) Mineral Resource Extraction Industry
- j) Railway Freight Yard
- k) Retail Store
- l) Used Building Material Retail Outlet

2.2.1 SPECIFIC DEVELOPMENT STANDARDS FOR DISCRETIONARY USES:

- a) For the purposes of this zoning district, a Retail Store shall be limited to the display and sale of goods manufactured on the site and shall be clearly subordinate to the principal use of the site or is for the purpose of marketing or promoting goods manufactured on site.

2.3. THE PERMITTED ACCESSORY USES SHALL BE:

- a) any building, structure or use, which is subordinate and exclusively devoted to the principal use of the site, but only if the principal permitted use or discretionary use has been established.

2.3.1 SPECIFIC DEVELOPMENT STANDARDS FOR ACCESSORY USES:

- a) Setbacks and general performance standards for an accessory use, building or structure shall meet the same requirements as the principal use, building or structure.

2.4. THE PROHIBITED USES SHALL BE:

- a) All uses of land, buildings, structures or industrial processes that may be noxious or injurious, or constitute a nuisance beyond the building which contains it by reason of the production or emission of dust, smoke, refuse, matter, odour, gas, fumes, noise, vibration or other similar substances or conditions.
- b) Residential Dwelling Units.
- c) Salvage Yards, Auto Wreckers, Commercial Composting Operations or any other use requiring the outdoor storage of unprocessed goods and materials.
- d) All uses of land, buildings and structures except those specifically noted as permitted or discretionary.

3. THE SITE REGULATIONS IN THE M1 DISTRICT SHALL BE:

In addition to the general provisions contained in this Bylaw the following regulations shall apply to every development in this district:

3.1. THE AREA REQUIREMENTS FOR PERMITTED AND DISCRETIONARY USES SHALL BE:

- a) The minimum site area shall be 0.8 ha (2 acres).
- b) The minimum lot frontage shall be 30 metres (98.4 ft).
- c) Public Utilities and Municipal Facilities are exempt from compliance with the minimum site area requirement.

4. ADDITIONAL REQUIREMENTS IN ASSOCIATION WITH ALL PERMITTED AND DISCRETIONARY USES SHALL BE:

4.1 SETBACKS:

- a) Front yards:  
All buildings shall be set back a minimum of 45 metres (147.6 ft) from the centerline of a municipal road allowance or provincial highway or such greater distance as required by the Saskatchewan Ministry of Highways and Infrastructure, excepting sites which front on an internal subdivision road which shall be setback a minimum of 20 metres (65.6 ft) from the front site line.
- b) Side yards:  
All buildings shall be set back a minimum of 8 metres (26.2 ft) from the side property line. Where a side yard abuts a municipal road allowance or provincial highway, the front yard requirements shall apply.
- c) Rear yards:  
All buildings shall be set back a minimum of 8 metres (26.2 ft) from the rear property line, excepting properties where the rear site line is adjacent to a municipal road in which case all buildings shall be setback a minimum of 45 metres (147.6 ft) from the center line of the road allowance.
- d) Public Utilities and Municipal Facilities are exempt from compliance with the building setback regulations.

4.2 BUILDING HEIGHT:

- a) The maximum building height shall be 17 metres (55.7 ft).

4.3 SIGNAGE:

In addition to the General Regulations contained in this Bylaw, the following additional development standards shall apply to the placement or erection of signage within a M1 District:

Large Scale Commercial or Industrial Establishments	<ol style="list-style-type: none"><li>1. Free standing signs shall not exceed a height of 14 m (45.9 ft).</li><li>2. Multiple free standing signs located on a single site shall maintain a separation distance of 12 m (39.37 ft) for every square metre of gross surface area of the larger of the two signs to a maximum separation distance of 150 m.</li><li>3. There is no gross surface area requirement for free standing signs.</li></ol>
All other Permitted and Discretionary Uses	<ol style="list-style-type: none"><li>1. One (1) multi-faced free standing sign shall be permitted per building frontage not exceeding a gross surface area of 14 m<sup>2</sup> (150.7 ft<sup>2</sup>) and a height of 14 m (45.9 ft).</li><li>2. Where a building maintains direct exposure to more than one public right of way, a second free standing sign shall be allowable following the previous regulations.</li></ol>

4.4 PARKING AND LOADING FACILITES:

- a) Off street parking shall be provided in accordance with all applicable requirements outlined in Section 3.15 of this Zoning Bylaw.
- b) Where the use of the building or site involves the receipt, distribution or dispatch by vehicles or equipment of materials, goods or merchandise, adequate dedicated and clearly defined space for such vehicles or equipment to stand for unloading or loading shall be provided on site.

4.5 SCREENING, STORAGE AND DISPLAY:

- a) All waste materials or unsightly elements shall be enclosed by buildings, or screened by landscape features, fences or a combination thereof to the satisfaction of the Development Officer.
- b) The storage and display of finished goods shall be permitted in a front yard where it is deemed essential to facilitate a permitted or approved discretionary use.

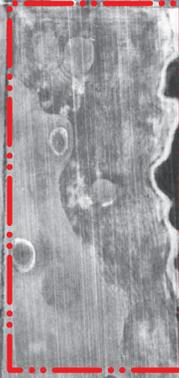
- c) All outdoor storage must be screened from view from adjacent municipal roadways and public lands by a solid fence, landscape materials, berm, vegetative plantings or any combination of the above at least two (2) metres in height.
- d) Vehicles or equipment associated with a permitted or approved discretionary use may be stored on-site provided the area used for storage of these vehicles or equipment does not occur within setback areas, is located in the rear and side yards only, and is screened from view from adjacent municipal roadways and public lands by a solid fence, landscape materials, berm, vegetative plantings or any combination of the above at least two (2) metres in height. No vehicles or equipment shall be in a state of disrepair.

4.6 LANDSCAPING STANDARDS:

- a) Prior to the issuance of a development and/or building permit for any permitted or discretionary use within a M1 District, the applicant shall be required to submit a landscape plan with a schedule of completion which is satisfactory to the Development Officer and prepared in compliance with the Commercial and Industrial Landscaping Requirements outlined in Section 4.13.26-38 of this Bylaw.
- b) An applicant shall be required to enter into an agreement with the Municipality to ensure the landscape plan complies with all relevant requirements of this bylaw.
- c) All landscaping requirements shall be completed in accordance with the municipally approved scheduled date of completion.
- d) Any significant changes to an approved landscape plan must be authorized by the Development Officer.

## **Appendix C**

### **Historical Aerial Photographs**



710A-48TH STREET EAST  
 SASKATOON SK S7K 5B4  
 306.244.1710  
 pintermain@pinter.ca

**LEGEND**  
 SUBJECT PROPERTY - APPROXIMATE LOCATION - - - - -



SCALE: 1: 8,000  
 FILE: H:\2\ PROJECTS\ 2880 FLORAL SUBDIVISION DEVELOPMENT  
 CDR\2880-1 PHASE I ESA\2880-1 DRAWINGS

**AERIAL PHOTOGRAPH**  
 1974

DATE: 22 FEBRUARY 2022  
 PROJECT: 2880-1 - PHASE I ESA, PARCEL B AND PARCEL C  
 OF NE-35-35-04-W3M, RM OF CORMAN PARK, SK.

DRAWN BY: NA  
 CHECKED BY: JC



**PINTER**  
& ASSOCIATES LTD

710A-48TH STREET EAST  
SASKATOON SK S7K 5B4  
306.244.1710  
pintermain@pinter.ca

**LEGEND**

SUBJECT PROPERTY - APPROXIMATE LOCATION - - - -



SCALE: 1: 8,000

FILE: H:\2\ PROJECTS\ 2880 FLORAL SUBDIVISION DEVELOPMENT  
CDR\2880-1 PHASE I ESA\2880-1 DRAWINGS

DRAWING TITLE:

**AERIAL PHOTOGRAPH**  
1986

DATE: 22 FEBRUARY 2022

DESCRIPTION: 2880-1 - PHASE I ESA, PARCEL B AND PARCEL C OF NE-35-04-W3M, RM OF CORMAN PARK, SK.

DRAWN BY: NA

CHECKED BY: JC



710A-48TH STREET EAST  
SASKATOON SK S7K 5B4  
306.244.1710  
pintermain@pinter.ca

**LEGEND**

SUBJECT PROPERTY - APPROXIMATE LOCATION - - - -



SCALE: 1: 8,000

FILE: H:\2\ PROJECTS\ 2880 FLORAL SUBDIVISION DEVELOPMENT  
CDR\2880-1 PHASE I ESA\2880-1 DRAWINGS

DRAWING TITLE:

**AERIAL PHOTOGRAPH  
1997**

DATE: 22 FEBRUARY 2022

PROJECT: 2880-1 - PHASE I ESA, PARCEL B AND PARCEL C  
OF NE-35-35-04-W3M, RM OF CORMAN PARK, SK.

DRAWN BY: NA

CHECKED BY: JC



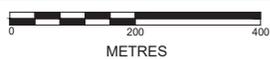
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710A-48TH STREET EAST  
 SASKATOON SK S7K 5B4  
 306.244.1710  
 pintermain@pinter.ca

**LEGEND**

SUBJECT PROPERTY - APPROXIMATE LOCATION - - - -



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FILE: H:\2\ PROJECTS\ 2880 FLORAL SUBDIVISION DEVELOPMENT  
 CDR\2880-1 PHASE I ESA\2880-1 DRAWINGS

DRAWING TITLE:

**AERIAL PHOTOGRAPH  
 2002**

DATE: 22 FEBRUARY 2022

DESCRIPTION:  
 2880-1 - PHASE I ESA, PARCEL B AND PARCEL C  
 OF NE-35-35-04-W3M, RM OF CORMAN PARK, SK.

DRAWN BY:  
 DRAWN BY: NA

CHECKED BY:  
 CHECKED BY: JC

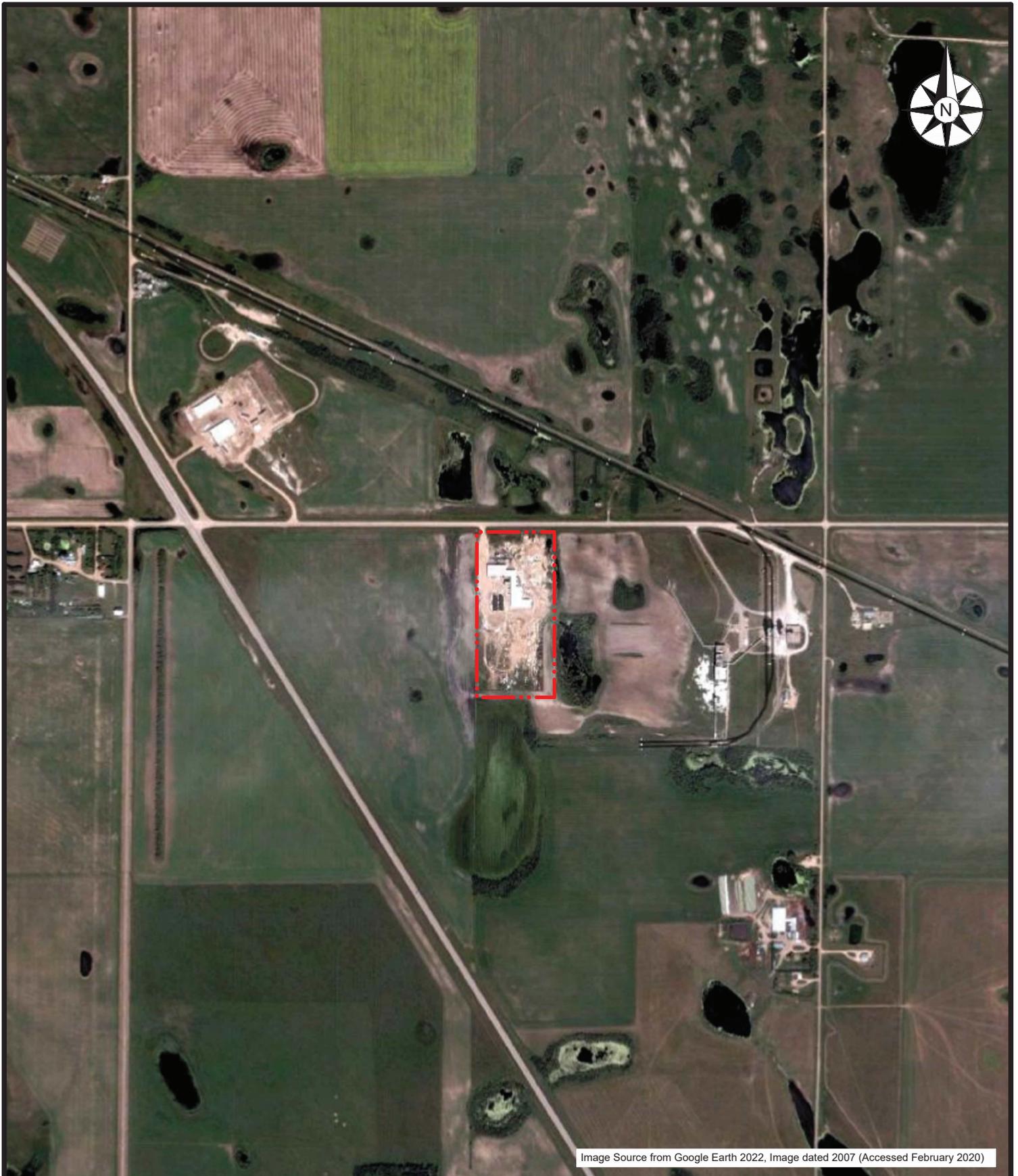


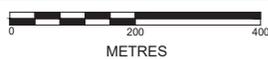
Image Source from Google Earth 2022, Image dated 2007 (Accessed February 2020)



710A-48TH STREET EAST  
 SASKATOON SK S7K 5B4  
 306.244.1710  
 pintermain@pinter.ca

**LEGEND**

SUBJECT PROPERTY - APPROXIMATE LOCATION - - - - -



SCALE: 1: 12,000

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 CDR\2880-1 PHASE I ESA\2880-1 DRAWINGS

DRAWING TITLE:

**AERIAL PHOTOGRAPH  
 2007**

DATE:

22 FEBRUARY 2022

DESCRIPTION:

2880-1 - PHASE I ESA, PARCEL B AND PARCEL C  
 OF NE-35-35-04-W3M, RM OF CORMAN PARK, SK.

DRAWN BY:

DRAWN BY: NA

CHECKED BY:

CHECKED BY: JC



Image Source from Google Earth 2022, Image dated 2015 (Accessed February 2020)



710A-48TH STREET EAST  
SASKATOON SK S7K 5B4  
306.244.1710  
pintermain@pinter.ca

**LEGEND**

SUBJECT PROPERTY - APPROXIMATE LOCATION - - - - -



SCALE: 1: 12,000

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DRAWING TITLE:

**AERIAL PHOTOGRAPH  
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DATE: 22 FEBRUARY 2022  
DESCRIPTION: 2880-1 - PHASE I ESA, PARCEL B AND PARCEL C OF NE-35-35-04-W3M, RM OF CORMAN PARK, SK.

DRAWN BY: NA

CHECKED BY: JC

# **Appendix D**

## **Tables**

**TABLE 1: Summary of Land Titles**

Owner (s) of Record	Date	Lot	Block	Plan	Title #
101046965 Saskatchewan Ltd.	08 September 2020	B		98MW20997	159230329
101046965 Saskatchewan Ltd.	08 September 2020	C		102326431	153230318
101046965 Saskatchewan Ltd.	18 February 2005	B		98MW20997	128818873
Affiliated Properties Inc.	19 September 2003	B		98MW20997	126777639
Bart Zimmer Realty Inc.	26 April 2002	B		98MW20997	107735700
Bart Zimmer Realty Inc.	12 February 1999	NE-35-35-4-W3M	B	98MW20997	99MW02289
LaFarge Canada Inc.	30 November 1998	NE-35-35-4-W3M	A	15207, 60S15837,71S11460, 80S37847	98MW19333
LaFarge Canada Inc.	29 December 1998	NE-35-35-4-W3M	B	98MW20997	98MW20997
LaFarge Canada Inc.	03 January 1990	NE-35-35-4-W3M	A	15207, 60S15837,71S11460, 80S37847	90S00360
Canada Cement LaFarge Ltd.	30 May 1983	NE-35-35-4-W3M	A	15207, 60S15837,71S11460, 80S37847	71S11456
The City of Saskatoon	21 January 1976	NE-35-35-4-W3M		63S18647	76S01672
Canada Cement LaFarge Ltd.	08 June 1971	NE-35-35-4-W3M	A	15207, 60S15837,71S11460, 80S37847	71S11456
Canada Cement Company Limited	08 June 1971			NE-35-35-4-W3M	71S11455
Canada Cement Company Limited	08 June 1971			NE-35-35-4-W3M	71S11454
Her Majesty the Queen in the Right and to the Use of Her Province of Saskatchewan	28 August 1964			NE-35-35-4-W3M	64S16426
Canada Cement Company Limited	15 November 1963			NE-35-35-4-W3M	63S20484
Montreal Trust Company	16 September 1960			SE-35-35-4-W3M	60S15840
Montreal Trust Company	16 September 1960			SE-35-35-4-W3M	60S15838
Montreal Trust Company	06 April 1960			NE-35-35-4-W3M	60S05836

2880-1 - Surface Parcel B Surface Parcel C of NE-35-35-04-W3M  
 RM of Corman Park, SK

Phase I ESA  
 March 2022



**TABLE 2: SMOE Hazardous Materials Storage Database Search Results**

<b>Operation ID</b>	<b>Operation Name</b>	<b>Address</b>	<b>Operation Status</b>	<b>Approximate Distance from Site</b>
7091	FRP Manufacturing Inc. Storage Site	R.R. #5, Site 501, Box 11, Saskatoon	Operating	0m (SP)

2880-1 - Surface Parcel B Surface Parcel C of NE-35-35-04-W3M  
RM of Corman Park, SK

Phase I ESA  
March 2022

**TABLE 3: SMOE Spills Database Search Results**

<b>Operation ID</b>	<b>Spill Date</b>	<b>Address</b>	<b>Contaminant</b>	<b>Quantity</b>	<b>Approximate Distance from Site</b>
-	19 November 2004	Clavet	Sulfuric Acid	400L	Unknown

2880-1 - Surface Parcel B Surface Parcel C of NE-35-35-04-W3M  
RM of Corman Park, SK

Phase I ESA  
March 2022

**Appendix E**  
**Land Titles**



# CERTIFICATE OF TITLE

M.C.

No. 98MW20997

Value \$

Grant No.

Ref. 98MW19333

THIS IS TO CERTIFY that **LAFARGE CANADA INC.**

Is now the owner of an estate in fee simple

of and in

**All that portion of the North East Quarter of Section 35**

Township 35

Range 4

West of the **Third** Meridian, Saskatchewan

**Shown as Parcel B, Plan 98MW20997**

**MINES AND MINERALS EXCEPTED** by 98MW19332

# CANCELLED

**SUBJECT TO THE ENCUMBRANCES, LIENS, AND INTERESTS NOTIFIED BY MEMORANDUM NOW OR HEREAFTER UNDERWRITTEN OR ENDORSED HEREON, OR WHICH ATTACH BY IMPLICATION PURSUANT TO THE LAND TITLES ACT. ANY REFERENCE TO AREA IS "MORE OR LESS".**

IN WITNESS WHEREOF I have hereunto subscribed my name and affixed my official seal this 29 day of December, 1998

Post Office Address  
12<sup>TH</sup> FLOOR, SUTHERLAND TOWER  
10655 SOUTHPORT ROAD S.W.  
CALGARY AB T2W 4Y1

NOTICE: The Land Titles Act requires that "every owner or mortgagee shall notify the Registrar of any change in his Post office Address."

  
\_\_\_\_\_  
Registrar  
Saskatoon Midwest Land Registration District

**CERTIFICATE OF TITLE**

**CHARGES, LIENS AND INTERESTS**

**ABBREVIATIONS**

AM – Affidavit of Marriage  
 RL – Realist's Lien  
 C – Caveat  
 CA – Commencement of Action  
 CCE – Certificate of Chief Engineer  
 CON – Consolidation  
 E – Enlargement  
 EA – Easement  
 F – Forfeiture  
 JO – Judge's Order  
 L – Lease  
 LP – Lis Pendens  
 LDT – Lost Duplicate  
 Certificate of Title  
 M – Mortgage  
 MBO – Mediation Board Order  
 MC – Mineral Certificate  
 MEA – Mortgage of Easement  
 ML – Mechanics' Lien

CERTIFICATE OF TITLE NO. 98MW20997

NAME **Lafarge Canada Inc.**

LAND **NE 35-35-4-W3rd, Pcl B, Plan 98MW20997**

**ABBREVIATIONS**

MO – Maintenance Order  
 MTO – Master of Titles Order  
 N – Notice  
 PA – Power of Attorney  
 PLN – Plan  
 PP – Postponement  
 PPS – Personal Property Security Act Notice  
 PWA – Party Wall Agreement  
 R – Renewal  
 REP – Replot  
 REQ – Request  
 SJT – Application by Surviving Joint Tenant  
 T – Transfer  
 TI – Transfer of Instrument  
 TL – Tax Lien  
 TR – Transmission  
 WE – Writ of Execution

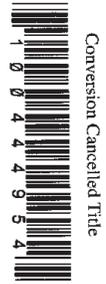
Nature of Instrument	Registration Number	Date of Registration	Amount	Particulars	Discharges and Withdrawals	
					Registration Number	Date of Registration
CCE	FH 1809	17 May 55		Certificate under the Water Rights Act, As to N ½ of NE ¼ only.		
C	83S19893	16 May 83		By: Schmidt Farms Ltd. c/o: Gauley & Co., Barristers & Solicitors, 300 701 Broadway Ave Saskatoon SK S7K 3L7 (As to NE ¼ only)		
C	89S14763	17 Apr 89		By: Canron Inc., c/o MacPherson Leslie & Co, Barristers, Box 1305, Regina SK S4P 3B8 (as to Ptn. Comm. at NW corner of ¼ Sec., thence E'ly along N bdry 600 ft; thence S parallel to W bdry 1,242 ft; thence W parallel with N bdry thence N along W bdry to the point of comm. Minerals Excepted)		
PP	89S40286	18 Sep 89		Caveat 83S19893 is postponed in favour of Caveat 89S14763		
C	98MW06993	29 Apr 98		By: Bart Zimmer Realty Inc. 250 1820 8 <sup>th</sup> Street East Saskatoon SK S7H 0T6 (As to NE ¼ only)		
T	99MW02289	12 Feb 99		To: Bart Zimmer Realty Inc. Title: 99MW02289		

**CANCELLED**

Registrar 



# CERTIFICATE OF TITLE



M.C.

No. 99MW02289

Value \$ 71,600.00

Grant No.

Ref. 98MW20997

THIS IS TO CERTIFY that **BART ZIMMER REALTY INC.**

is now the owner of an estate in fee simple

of and in

**All that portion of the North East Quarter of Section 35**

Township **35**

Range **4**

West of the **Third Meridian**, Saskatchewan

Shown as Parcel B, Plan 98MW20997

**MINES AND MINERALS EXCEPTED** by 98MW19332

**SUBJECT TO THE ENCUMBRANCES, LIENS, AND INTERESTS NOTIFIED BY MEMORANDUM NOW OR  
HEREAFTER UNDERWRITTEN OR ENDORSED HEREON, OR WHICH ATTACH BY IMPLICATION  
PURSUANT TO THE LAND TITLES ACT. ANY REFERENCE TO AREA IS "MORE OR LESS".**

IN WITNESS WHEREOF I have hereunto subscribed my name and affixed my official seal this  
12 day of February, 1999

Post Office Address  
#250, 1820 - 8<sup>th</sup> St. East  
SASKATOON SK S7H 0T6

**NOTICE: The Land Titles Act requires that "every  
owner or mortgagee shall notify the Registrar of any  
change in his Post office Address."**

  
\_\_\_\_\_  
Registrar  
Saskatoon Midwest Land Registration District

**CERTIFICATE OF TITLE**

**ABBREVIATIONS**

AM – Affidavit of Marriage  
 BL – Builders' Lien  
 C – Caveat  
 CA – Commencement of Action  
 CCE – Certificate of Chief Engineer  
 CON – Consolidation  
 E – Enlargement  
 EA – Easement  
 F – Forfeiture  
 JO – Judge's Order  
 L – Lease  
 LP – Lis Pendens  
 LDT – Lost Duplicate  
 Certificate of Title  
 M – Mortgage  
 MBO – Mediation Board Order  
 MC – Mineral Certificate  
 MEA – Mortgage of Easement  
 ML – Mechanics' Lien

**CHARGES, LIENS AND INTERESTS**

CERTIFICATE OF TITLE NO. 99MW02209

NAME **Bart Zimmer Realty Inc.**

LAND **NE 35-35-4-W3rd, Pcl B, Pl. 98MW20997**

**ABBREVIATIONS**

MO – Maintenance Order  
 MTO – Master of Titles Order  
 N – Notice  
 PA – Power of Attorney  
 PLN – Plan  
 PP – Postponement  
 PPS – Personal Property  
 Security Act Notice  
 PWA – Party Wall Agreement  
 R – Renewal  
 REP – Replot  
 REQ – Request  
 SJT – Application by  
 Surviving Joint Tenant  
 T – Transfer  
 TI – Transfer of Instrument  
 TL – Tax Lien  
 TR – Transmission  
 WE – Writ of Execution

Nature of Instrument	Registration Number	Date of Registration	Amount	Particulars	Discharges and Withdrawals	
					Registration Number	Date of Registration
CCE	FH 1809	17 May 55		Certificate under the Water Rights Act, As to N ½ of NE ¼ only.		
C	83S19893	16 May 83		By: Schmidt Farms Ltd. c/o: Gauley & Co., Barristers & Solicitors, 300 701 Broadway Ave Saskatoon SK S7K 3L7 (As to NE only)	99MW02589	18 Feb 99
C	89S14763	17 Apr 89		By: Canron Inc., c/o MacPherson Leslie & Co, Barristers, Box 1305, Regina SK S4P 3B8 (as to Ptn. Comm. at NW corner of ¼ Sec., thence E'ly along N bdry 600 ft; thence S parallel to W bdry 1,242 ft; thence W parallel with N bdry thence N along W bdry to the point of comm. Minerals Excepted)	99MW07453	13 May 99
PP	89S40286	18 Sep 89		Caveat 83S19893 is postponed in favour of Caveat 89S14763	99MW02589	18 Feb 99
C	98MW06993	29 Apr 98		By: Bart Zimmer Realty Inc. 250 1820 8 <sup>th</sup> Street East Saskatoon SK S7H 0T6 (As to NE ¼ only)	99MW03533	9 Mar 99
C	99MW02590	18 Feb 99		Restrictive Covenant By: Lafarge Canada Inc. c/o Mc Kercher Mc Kercher & Co., 300 374 3 <sup>rd</sup> Avenue South SASKATOON SK 7K 1M5 Att: Lorne Larson		

  
 Registrar

# Province of Saskatchewan Land Titles Registry Title

**Title #:** 107735700

**Title Status:** Inactive

**Parcel Type:** Surface

**Parcel Value:** \$572,000.00 CAD

**Title Value:** \$572,000.00 CAD

**Converted Title:** 99MW02289

**Previous Title and/or Abstract #:** 99MW02289

**As of:** 08 Feb 2022 16:18:10

**Last Amendment Date:** 19 Sep 2003 16:10:42.837

**Issued:** 26 Apr 2002 18:36:34.903

**Municipality:** RM OF CORMAN PARK NO. 344

Bart Zimmer Realty Inc. is the registered owner of Surface Parcel #120598768

Reference Land Description: Blk/Par B Plan No 98MW20997 Extension 1

As described on Certificate of Title 99MW02289.

This title is subject to any registered interests set out below and the exceptions, reservations and interests mentioned in section 14 of *The Land Titles Act, 2000*.

## **Registered Interests:**

None

## **Addresses for Service:**

### **Name**

#### **Owner:**

Bart Zimmer Realty Inc.

Client #: 104830017

### **Address**

250-1820-8th St E Saskatoon, Saskatchewan, Canada S7H  
0T6

## **Notes:**

Parcel Class Code: Parcel (Generic)



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# Province of Saskatchewan Land Titles Registry Title

**Title #:** 126777639

**Title Status:** Inactive

**Parcel Type:** Surface

**Parcel Value:** \$572,000.00 CAD

**Title Value:** \$572,000.00 CAD

**Converted Title:** 99MW02289

**Previous Title and/or Abstract #:** 107735700

**As of:** 08 Feb 2022 16:17:24

**Last Amendment Date:** 18 Feb 2005 13:42:04.293

**Issued:** 19 Sep 2003 16:10:41.383

**Municipality:** RM OF CORMAN PARK NO. 344

AFFILIATED PROPERTIES INC. is the registered owner of Surface Parcel  
#120598768

Reference Land Description: Blk/Par B Plan No 98MW20997 Extension 1  
As described on Certificate of Title 99MW02289.

This title is subject to any registered interests set out below and the exceptions, reservations and interests mentioned in section 14 of *The Land Titles Act, 2000*.

## **Registered Interests:**

None

## **Addresses for Service:**

### **Name**

#### **Owner:**

AFFILIATED PROPERTIES INC.

Client #: 100063336

### **Address**

#100, 316 - 6TH AVENUE NORTH SASKATOON, SK, Canada  
S7K 2S5

## **Notes:**

Parcel Class Code: Parcel (Generic)



**Back to top**

# Province of Saskatchewan Land Titles Registry Title

**Title #:** 128818873

**Title Status:** Inactive

**Parcel Type:** Surface

**Parcel Value:** \$572,000.00 CAD

**Title Value:** \$572,000.00 CAD

**Converted Title:** 99MW02289

**Previous Title and/or Abstract #:** 126777639

**As of:** 08 Feb 2022 16:16:44

**Last Amendment Date:** 08 Sep 2020 16:35:21.750

**Issued:** 18 Feb 2005 13:42:00.450

**Municipality:** RM OF CORMAN PARK NO. 344

101046965 SASKATCHEWAN LTD. is the registered owner of Surface Parcel  
#120598768

Reference Land Description: Blk/Par B Plan No 98MW20997 Extension 1  
As described on Certificate of Title 99MW02289.

This title is subject to any registered interests set out below and the exceptions, reservations and interests mentioned in section 14 of *The Land Titles Act, 2000*.

## **Registered Interests:**

None

## **Addresses for Service:**

### **Name**

#### **Owner:**

101046965 SASKATCHEWAN LTD.

Client #: 114905099

### **Address**

200 PRINCETON TOWER 123-2ND AVENUE SOUTH  
SASKATOON, Saskatchewan, Canada S7K 7E6

## **Notes:**

Parcel Class Code: Parcel (Generic)



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# Province of Saskatchewan Land Titles Registry Title

**Title #:** 153230318  
**Title Status:** Active  
**Parcel Type:** Surface  
**Parcel Value:** \$300,000.00 CAD  
**Title Value:** \$300,000.00 CAD  
**Converted Title:** 99MW02289  
**Previous Title and/or Abstract #:** 128818873

**As of:** 08 Feb 2022 16:16:08  
**Last Amendment Date:** 01 Dec 2021 12:00:29.567  
**Issued:** 08 Sep 2020 16:35:20.847  
**Municipality:** RM OF CORMAN PARK NO. 344

101046965 SASKATCHEWAN LTD. is the registered owner of Surface Parcel #203772326

Reference Land Description: Blk/Par C Plan No 102326431 Extension 0

This title is subject to any registered interests set out below and the exceptions, reservations and interests mentioned in section 14 of *The Land Titles Act, 2000*.

## Registered Interests:

**Interest #:**  
**188706202**

CNV Restrictive Covenant

**Value:** N/A  
**Reg'd:** 18 Feb 1999 02:45:03  
**Interest Register Amendment Date:** N/A  
**Interest Assignment Date:** N/A  
**Interest Scheduled Expiry Date:** N/A  
**Expiry Date:** N/A

**Holder:**  
 Lafarge Canada Inc.  
 Attn: Lorne Larson, McKercher et al 300-374-3rd Ave S  
 Saskatoon, Saskatchewan, Canada  
**Client #:** 104830006

**Int. Register #:** 102520987  
**Converted Instrument #:** 99MW02590

**Interest #:**  
**188706213**

Joint Use Utility Easement

**Value:** N/A  
**Reg'd:** 29 Aug 2013 15:48:47  
**Interest Register Amendment Date:** N/A  
**Interest Assignment Date:** N/A  
**Interest Scheduled Expiry Date:** N/A  
**Expiry Date:** N/A

**Holder as Tenant in Common**  
**Interest Share:** 1/2  
**Interest Share Number:** 204360577  
**Holder:**  
 SASKATCHEWAN POWER CORPORATION  
 2025 VICTORIA AVE  
 REGINA, SK, Canada S4P 0S1  
**Client #:** 100307618

**Holder as Tenant in Common**  
**Interest Share: 1/2**  
**Interest Share Number: 204360588**  
**Holder:**  
 Saskatchewan Telecommunications  
 13th Floor, 2121 Saskatchewan Drive  
 Regina, Saskatchewan, Canada S4P 3Y2  
**Client #:** 100006861

**Int. Register #:** 119417924

**Interest #:**  
**188706224**

Mortgage

**Value:** \$1,200,000.00 CAD  
**Reg'd:** 28 Dec 2018 09:55:11  
**Interest Register Amendment Date:** N/A  
**Interest Assignment Date:** N/A  
**Interest Scheduled Expiry Date:** N/A  
**Expiry Date:** N/A

**Holder:**  
 Affinity Credit Union 2013  
 PO Box 1330  
 Saskatoon, Saskatchewan, Canada S7K 3P4  
**Client #:** 128808029

**Int. Register #:** 123265425

**Interest #:**  
**188706235**

Assignment of Rents

**Value:** N/A  
**Reg'd:** 28 Dec 2018 09:55:11  
**Interest Register Amendment Date:** N/A  
**Interest Assignment Date:** N/A  
**Interest Scheduled Expiry Date:** N/A  
**Expiry Date:** N/A

**Holder:**  
 Affinity Credit Union 2013  
 PO Box 1330  
 Saskatoon, Saskatchewan, Canada S7K 3P4  
**Client #:** 128808029

**Int. Register #:** 123265436

**Interest #:**  
**188706246**

Planning and Development  
 Act, 2007-Interest  
 Protecting Agreement  
 (Section 235)

**Value:** N/A  
**Reg'd:** 12 Nov 2019 10:49:16  
**Interest Register Amendment Date:** N/A  
**Interest Assignment Date:** N/A  
**Interest Scheduled Expiry Date:** N/A  
**Expiry Date:** N/A

**Holder:**  
 RURAL MUNICIPALITY OF CORMAN PARK NO. 344  
 111 PineHouse Drive  
 Saskatoon, Saskatchewan, Canada S7K 5W1  
**Client #:** 101591580

**Int. Register #:** 123728755

**Interest #:**

**192523811**

Miscellaneous Interest

**Value:** N/A  
**Reg'd:** 23 Nov 2021 14:56:22  
**Interest Register Amendment Date:** N/A  
**Interest Assignment Date:** N/A  
**Interest Scheduled Expiry Date:** N/A  
**Expiry Date:** N/A

A Purchase Interest pursuant to a Sale and Purchase Agreement dated effective October 15, 2021, between 101046965 Saskatchewan Ltd. and Quantum Genetix Canada Inc.

**Holder:**

Quantum Genetix Canada Inc.  
c/o 300-110 21st Street East  
Saskatoon, SK, Canada S7K 0B6

**Client #:** 137725533**Int. Register #:** 124844698**Interest #:**  
**192523833**Enforcement Charge -  
Provincial Judgment

**Value:** \$92,809.06 CAD  
**Reg'd:** 23 Nov 2021 14:56:22  
**Interest Register Amendment Date:** N/A  
**Interest Assignment Date:** N/A  
**Interest Scheduled Expiry Date:** N/A  
**Expiry Date:** N/A

JUDGMENT DATE: 27-AUG-2019 DEBTOR NAME: Quantum Genetix  
Canada Inc. /Quantum Genetix Canada Inc.

**Holder:**

Biosero Inc  
26741 Portola Parkway, Suite 1E #610  
Foothill Ranch, California, United States of America 92610

**Client #:** 137733802**Int. Register #:** 124844711**Judgment Registry #:** 301946741**Interest #:**  
**192523844**Enforcement Charge -  
Federal Judgment

**Value:** \$184,602.48 CAD  
**Reg'd:** 23 Nov 2021 14:56:22  
**Interest Register Amendment Date:** N/A  
**Interest Assignment Date:** N/A  
**Interest Scheduled Expiry Date:** N/A  
**Expiry Date:** N/A

JUDGMENT DATE: 18-JUL-2019 DEBTOR NAME: Quantum Genetix  
Canada Inc.

**Holder:**

Her Majesty the Queen in Right of Canada  
1955 Smith Street  
Regina, Saskatchewan, Canada S4P 2N9

**Client #:** 122717448**Int. Register #:** 124844722**Judgment Registry #:** 301948194**Addresses for Service:****Name****Owner:**

101046965 SASKATCHEWAN LTD.

**Address**200 PRINCETON TOWER 123-2ND AVENUE SOUTH  
SASKATOON, Saskatchewan, Canada S7K 7E6

Client #: 114905099

**Notes:**

Parcel Class Code: [Parcel \(Generic\)](#)

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# Province of Saskatchewan Land Titles Registry Title

**Title #:** 153230329  
**Title Status:** Active  
**Parcel Type:** Surface  
**Parcel Value:** \$300,000.00 CAD  
**Title Value:** \$300,000.00 CAD  
**Converted Title:** 99MW02289  
**Previous Title and/or Abstract #:** 128818873

**As of:** 08 Feb 2022 16:13:57  
**Last Amendment Date:** 08 Sep 2020 16:35:22.127  
**Issued:** 08 Sep 2020 16:35:21.860  
**Municipality:** RM OF CORMAN PARK NO. 344

101046965 SASKATCHEWAN LTD. is the registered owner of Surface Parcel #203772337

Reference Land Description: Blk/Par B Plan No 98MW20997 Extension 2

This title is subject to any registered interests set out below and the exceptions, reservations and interests mentioned in section 14 of *The Land Titles Act, 2000*.

## **Registered Interests:**

**Interest #:**  
**188706257**

CNV Restrictive Covenant

**Value:** N/A  
**Reg'd:** 18 Feb 1999 02:45:03  
**Interest Register Amendment Date:** N/A  
**Interest Assignment Date:** N/A  
**Interest Scheduled Expiry Date:** N/A  
**Expiry Date:** N/A

**Holder:**  
 Lafarge Canada Inc.  
 Attn: Lorne Larson, McKercher et al 300-374-3rd Ave S  
 Saskatoon, Saskatchewan, Canada  
**Client #:** 104830006

**Int. Register #:** 102520987  
**Converted Instrument #:** 99MW02590

**Interest #:**  
**188706268**

Joint Use Utility Easement

**Value:** N/A  
**Reg'd:** 29 Aug 2013 15:48:47  
**Interest Register Amendment Date:** N/A  
**Interest Assignment Date:** N/A  
**Interest Scheduled Expiry Date:** N/A  
**Expiry Date:** N/A

**Holder as Tenant in Common**  
**Interest Share:** 1/2  
**Interest Share Number:** 204360634  
**Holder:**  
 SASKATCHEWAN POWER CORPORATION  
 2025 VICTORIA AVE  
 REGINA, SK, Canada S4P 0S1  
**Client #:** 100307618

**Holder as Tenant in Common**  
**Interest Share: 1/2**  
**Interest Share Number: 204360645**  
**Holder:**  
 Saskatchewan Telecommunications  
 13th Floor, 2121 Saskatchewan Drive  
 Regina, Saskatchewan, Canada S4P 3Y2  
**Client #:** 100006861

**Int. Register #:** 119417924

**Interest #:**  
**188706279**

Mortgage

**Value:** \$1,200,000.00 CAD  
**Reg'd:** 28 Dec 2018 09:55:11  
**Interest Register Amendment Date:** N/A  
**Interest Assignment Date:** N/A  
**Interest Scheduled Expiry Date:** N/A  
**Expiry Date:** N/A

**Holder:**  
 Affinity Credit Union 2013  
 PO Box 1330  
 Saskatoon, Saskatchewan, Canada S7K 3P4  
**Client #:** 128808029

**Int. Register #:** 123265425

**Interest #:**  
**188706280**

Assignment of Rents

**Value:** N/A  
**Reg'd:** 28 Dec 2018 09:55:11  
**Interest Register Amendment Date:** N/A  
**Interest Assignment Date:** N/A  
**Interest Scheduled Expiry Date:** N/A  
**Expiry Date:** N/A

**Holder:**  
 Affinity Credit Union 2013  
 PO Box 1330  
 Saskatoon, Saskatchewan, Canada S7K 3P4  
**Client #:** 128808029

**Int. Register #:** 123265436

**Interest #:**  
**188706291**

Planning and Development  
 Act, 2007-Interest  
 Protecting Agreement  
 (Section 235)

**Value:** N/A  
**Reg'd:** 12 Nov 2019 10:49:16  
**Interest Register Amendment Date:** N/A  
**Interest Assignment Date:** N/A  
**Interest Scheduled Expiry Date:** N/A  
**Expiry Date:** N/A

**Holder:**  
 RURAL MUNICIPALITY OF CORMAN PARK NO. 344  
 111 PineHouse Drive  
 Saskatoon, Saskatchewan, Canada S7K 5W1  
**Client #:** 101591580

**Int. Register #:** 123728755

**Addresses for Service:**

<b>Name</b>	<b>Address</b>
<b>Owner:</b> 101046965 SASKATCHEWAN LTD.  Client #: 114905099	200 PRINCETON TOWER 123-2ND AVENUE SOUTH SASKATOON, Saskatchewan, Canada S7K 7E6
<b><u>Notes:</u></b>	
Parcel Class Code: <a href="#">Parcel (Generic)</a>	

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Canada

Province of Saskatchewan

Value \$7,801.00



No. 60-S-05836

Grant No.

Ref. 106 M 51

### CERTIFICATE OF TITLE

THIS IS TO CERTIFY that *MONTREAL TRUST COMPANY*

*is now the owner of an estate in fee simple of and in the North Half of the North East Quarter of Section Thirty-five (35) in Township Thirty-five (35) in Range Four (4) West of the Third Meridian*

*in the Province of Saskatchewan, in the Dominion of Canada, containing Eighty (80) acres, more or less.*

EXCEPTING: *thereout One and Nine Hundred and Eighty-four Thousandths (1.984) acres, more or less, taken for Right of Way and extra land of the Canadian Pacific Railway as shown on a Plan of Record in the Land Titles Office for the Saskatoon Land Registration District as No. I 5207*

*Minerals Included*

**CANCELLED**

**SUBJECT TO THE ENCUMBRANCES, LIENS AND INTERESTS NOTIFIED BY MEMORANDUM NOW OR HEREAFTER UNDERWRITTEN OR ENDORSED HEREON, OR WHICH ATTACH BY IMPLICATION UNDER THE LAND TITLES ACT.**

IN WITNESS WHEREOF I have hereunto subscribed my name and affixed my official seal this *6th* day of *April*, A.D. 19 *60*.

Post Office Address *Montreal*  
*Quebec*

et

*B. L. Adams* Registrar  
*Saskatoon* Land Registration District  
Province of Saskatchewan



Canada

Province of Saskatchewan

Value \$ 7,794.00



No. 60-S-15838

Grant No.

Ref. 123 R 66

### CERTIFICATE OF TITLE

THIS IS TO CERTIFY that *MONTREAL TRUST COMPANY*

*is* now the owner of an estate in fee simple  
of and in *The South Half of the North East Quarter of Section Thirty-five (35)*  
*in Township Thirty-five (35)*  
*in Range Four (4)*  
*West of the Third Meridian*  
*in the Province of Saskatchewan, in the Dominion of Canada, containing Eighty (80)*  
*acres, more or less. EXCEPTING THEREOUT AND THEREFROM that portion described as*  
*Parcel "A" on a Plan of Record in the Land Titles Office for the Saskatoon Land*  
*Registration District as No. 60-S-15837.*

*Minerals Included*

**CANCELLED**

**SUBJECT TO** THE ENCUMBRANCES, LIENS AND INTERESTS NOTIFIED BY MEMORANDUM NOW OR HEREAFTER UNDERWRITTEN OR ENDORSED HEREON, OR WHICH ATTACH BY IMPLICATION UNDER THE LAND TITLES ACT.

IN WITNESS WHEREOF I have hereunto subscribed my name and affixed my official seal this *16th*  
day of *September*, A.D. 19 *60*.  
Post Office Address *Montreal,*  
*Quebec*

et

*S. G. Adams* Registrar  
*Saskatoon* Land Registration District  
Province of Saskatchewan



Canada

Province of Saskatchewan

Value \$ 15,174.00



No. 60-S-15840

Grant No. ....

Ref. 60-S-12959

### CERTIFICATE OF TITLE RENEWAL

THIS IS TO CERTIFY that **MONTREAL TRUST COMPANY**

*is* now the owner of an estate in fee simple  
of and in *the South East Quarter of Section Thirty-five (35),  
in Township Thirty-five (35),  
in Range Four (4),  
West of the Third Meridian,  
in the Province of Saskatchewan, in the Dominion of Canada, containing One Hundred and  
Sixty (160) acres, more or less, excepting thereout Parcel "B" as shown on a Plan of  
Record in the Land Titles Office for the Saskatoon Land Registration District as No.  
60-S-15839, and containing Eight and Twenty-six Hundredths (8.26) acres, more or less.*

*Minerals Included.*

**CANCELLED**

**SUBJECT TO** THE ENCUMBRANCES, LIENS AND INTERESTS NOTIFIED BY MEMORANDUM NOW OR  
HEREAFTER UNDERWRITTEN OR ENDORSED HEREON, OR WHICH ATTACH BY IMPLICATION UNDER  
THE LAND TITLES ACT.

IN WITNESS WHEREOF I have hereunto subscribed my name and affixed my official seal this .....16th.....  
day of .....September....., A.D. 19..60..

Post Office Address .....**Montreal,**.....

.....**Quebec.**.....

*[Signature]* Registrar

cr

.....**Saskatoon**..... Land Registration District

Province of Saskatchewan



Canada

Province of Saskatchewan

\$7,801.00 - N $\frac{1}{2}$  of NE $\frac{1}{4}$

\$7,794.00 - S $\frac{1}{2}$  of NE $\frac{1}{4}$

\$15,174.00 - SE $\frac{1}{4}$

Value \$.....



No. 63-S-20484.....

Grant No. ....

Ref. 60-S-05836.....

60-S-15838.....

60-S-15840.....

## CERTIFICATE OF TITLE

THIS IS TO CERTIFY that **CANADA CEMENT COMPANY LIMITED**

is now the owner of an estate in fee simple

of and in *The East Half of Section Thirty-five (35)*

*in Township Thirty-five (35)*

*in Range Four (4)*

*West of the Third Meridian,*

*in the Province of Saskatchewan, in the Dominion of Canada, containing Three Hundred and Twenty (320) acres, more or less. EXCEPTING THEREOUT: Firstly: One and Nine Hundred and Eighty-four Thousandths (1.984) acres, more or less, out of the North East Quarter taken for Right of Way and Extra land of the Canadian Pacific Railway as shown on a Plan of Record in the Land Titles Office for the Saskatoon Land Registration District as No. I 5207. Secondly: Out of the said North East Quarter, all that portion described as Parcel "A" on a Plan of Record in the said Land Titles Office as No. 60-S-15837, and Thirdly: Out of the South East Quarter, all that portion described as Parcel "B" on a Plan of Record in the said Land Titles Office as No. 60-S-15839, and containing Eight and Twenty-six Hundredths (8.26) acres, more or less.*

*Minerals Included*

# CANCELLED

**SUBJECT TO** THE ENCUMBRANCES, LIENS AND INTERESTS NOTIFIED BY MEMORANDUM NOW OR HEREAFTER UNDERWRITTEN OR ENDORSED HEREON, OR WHICH ATTACH BY IMPLICATION UNDER THE LAND TITLES ACT.

IN WITNESS WHEREOF I have hereunto subscribed my name and affixed my official seal this 15th

day of November, A.D. 19 63

Post Office Address Montreal,

Quebec.

et

*H. James* Registrar

Saskatoon Land Registration District

Province of Saskatchewan



Value \$.....



No. 64-S-16426.....

Grant No. ....

Ref. 63-S-20484, etc.

### CERTIFICATE OF TITLE

THIS IS TO CERTIFY that *HER MAJESTY THE QUEEN IN THE RIGHT AND TO THE USE OF HER PROVINCE OF SASKATCHEWAN*

*is* now the owner of an estate in fee simple

of and in *all those portions of the*

✓ *North East Quarter of Section Thirty-five (35), containing Seventy-two Hundredths (0.72) of an acre, more or less, and of the*

✓ *North West Quarter of Section Thirty-five (35), containing One (1.00) acre, more or less,*

*both being in Township Thirty-five (35), in Range Four (4), West of the Third Meridian, in the Province of Saskatchewan, in the Dominion of Canada, all taken for Roadway, as shown on a Plan of Record in The Department of Highways and Transportation, Regina, as No. 23289, and also of Record in the Land Titles Office for the Saskatoon Land Registration District as No. 64-S-16426.*

**CANCELLED**

**SUBJECT TO** THE ENCUMBRANCES, LIENS AND INTERESTS NOTIFIED BY MEMORANDUM NOW OR HEREAFTER UNDERWRITTEN OR ENDORSED HEREON, OR WHICH ATTACH BY IMPLICATION UNDER THE LAND TITLES ACT.

IN WITNESS WHEREOF I have hereunto subscribed my name and affixed my official seal this .....*28th*..... day of .....*August*....., A.D. 19..64..

Post Office Address *Department of Highways and Transportation,*  
*Regina, Sask.*

.....*E. C. Collins*..... Registrar  
*Saskatoon*..... Land Registration District

cr



Canada

Province of Saskatchewan

Value \$.....



No. 71-S-11454.....

Grant No. ....

Ref. 64-S-04664.....

### CERTIFICATE OF TITLE

THIS IS TO CERTIFY that CANADA CEMENT COMPANY LIMITED

is now the owner of an estate in fee simple

of and in the surveyed road in the North East Quarter of Section Thirty-five (35),

in Township Thirty-five (35),

in Range Four (4),

West of the Third Meridian,

in the Province of Saskatchewan, in the Dominion of Canada, shown on a Plan of Record

in the Land Titles Office for the Saskatoon Land Registration District as No. 64-S-04664

and containing One and Fourteen Hundredths (1.14) acres, more or less.

**CANCELLED**

**SUBJECT TO** THE ENCUMBRANCES, LIENS AND INTERESTS NOTIFIED BY MEMORANDUM NOW OR HEREAFTER UNDERWRITTEN OR ENDORSED HEREON, OR WHICH ATTACH BY IMPLICATION UNDER THE LAND TITLES ACT.

IN WITNESS WHEREOF I have hereunto subscribed my name and affixed my official seal this *Eighth*.....

day of *June*....., A.D. 19*71*.....

Post Office Address *Montreal, Quebec*.....

r/c

Registrar

Saskatoon

Land Registration District

Province of Saskatchewan



Canada

Province of Saskatchewan



Value \$ .....

No. 71-S-11455.....

Grant No. ....

Ref. 64-S-16426.....

### CERTIFICATE OF TITLE

THIS IS TO CERTIFY that CANADA CEMENT COMPANY LIMITED

is now the owner of an estate in fee simple

of and in the surveyed road in the North East Quarter of Section Thirty-five (35),

in Township Thirty-five (35),

in Range Four (4),

West of the Third Meridian,

in the Province of Saskatchewan, in the Dominion of Canada, shown on a Plan of Record

in the Land Titles Office for the Saskatoon Land Registration District as No. 64-S-16426

and containing Seventy-two Hundredths (0.72) of an acre, more or less.

**CANCELLED**

**SUBJECT TO** THE ENCUMBRANCES, LIENS AND INTERESTS NOTIFIED BY MEMORANDUM NOW OR HEREAFTER UNDERWRITTEN OR ENDORSED HEREON, OR WHICH ATTACH BY IMPLICATION UNDER THE LAND TITLES ACT.

IN WITNESS WHEREOF I have hereunto subscribed my name and affixed my official seal this *Eight*.....

day of ..... *June* ....., A.D. 19 *71*..

Post Office Address *Montreal, Quebec.*.....

r/c

.....  
*[Signature]* Registrar  
.....  
*Saskatoon*..... Land Registration District

Province of Saskatchewan





Value \$ 7,801.00  
N<sup>1</sup>/<sub>2</sub> of NE<sup>1</sup>/<sub>4</sub>  
7,794.00 S<sup>1</sup>/<sub>2</sub> of NE<sup>1</sup>/<sub>4</sub>  
15,174.00 SE<sup>1</sup>/<sub>4</sub>  
Grant No. ....

No. 71-S-11456  
63-S-20484  
71-S-11454  
Ref. 71-S-11455

### CERTIFICATE OF TITLE

THIS IS TO CERTIFY that CANADA CEMENT COMPANY LIMITED

is now the owner of an estate in fee simple  
of and in the East Half of Section Thirty-five (35),  
in Township Thirty-five (35),  
in Range Four (4),  
West of the Third Meridian,

in the Province of Saskatchewan, in the Dominion of Canada, containing Three Hundred and Twenty (320) acres, more or less, according to Dominion Government Survey thereof, EXCEPT:

FIRSTLY: One and Nine Hundred and Eighty-four Thousandths (1.984) acres, more or less, out of the North East Quarter, taken for Right of Way and Extra land of the Canadian Pacific Railway as shown on a Plan of Record in the Land Titles Office for the Saskatoon Land Registration District as No. I 5207.

SECONDLY: Out of the said North East Quarter, all that portion described as Parcel "A", on a Plan of Record in said Land Titles Office as No. 60-S-15837.

THIRDLY: Out of the South East Quarter, all that portion described as Parcel "B", on a Plan of Record in said Land Titles Office as No. 60-S-15839.

FOURTHLY: Thirteen and Seventy-eight Hundredths (13.78) acres, more or less, out of the South East Quarter, taken for a Roadway, as shown on a Plan of Record in said Land Titles Office as No. 68-S-06419.

Minerals included.

# CANCELLED

SUBJECT TO THE ENCUMBRANCES, LIENS AND INTERESTS NOTIFIED BY MEMORANDUM NOW OR HEREAFTER UNDERWRITTEN OR ENDORSED HEREON, OR WHICH ATTACH BY IMPLICATION UNDER THE LAND TITLES ACT.

IN WITNESS WHEREOF I have hereunto subscribed my name and affixed my official seal this Eighth day of June, A.D. 19 71.

Post Office Address Montreal, Quebec.

rk

  
Registrar  
Saskatoon Land Registration District



Value \$ 163,800.00



No. 76-S-01672

Grant No. ....

Ref. 70-S-04634

### CERTIFICATE OF TITLE

THIS IS TO CERTIFY that THE CITY OF SASKATOON

is now the owner of an estate in fee simple

of and in the North West Quarter of Section Twenty-two (22),  
in Township Thirty-seven (37),  
in Range Five (5),  
West of the Third Meridian,

in the Province of Saskatchewan, in the Dominion of Canada, containing One Hundred and Sixty (160) acres, more or less, according to Dominion Government Survey thereof;

EXCEPT: Firstly: Six and Eight Hundredths (6.08) acres, more or less, taken for Right of Way of the Canadian Northern Railway, as shown on a Plan of Record in the Land Titles Office for the Saskatoon Land Registration District as No. CW 2950; Secondly: Ninety-three Hundredths (0.93) of an acre, more or less, shown as Parcel "A" and Three Hundredths (0.03) of an acre, more or less, shown as Parcel "B", taken for Roadway as shown on Plan No. 63-S-18647 of record in said Land Titles Office.

MINERALS IN THE CROWN.

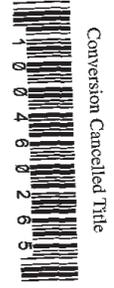
## Plan Ex

**SUBJECT TO THE ENCUMBRANCES, LIENS AND INTERESTS NOTIFIED BY MEMORANDUM NOW OR HEREAFTER UNDERWRITTEN OR ENDORSED HEREON, OR WHICH ATTACH BY IMPLICATION UNDER THE LAND TITLES ACT.**

IN WITNESS WHEREOF I have hereunto subscribed my name and affixed my official seal this twenty-first day of January, A.D. 1976.

Post Office Address .....  
.....Saskatoon, Saskatchewan.....

.....  
.....Registrar.....  
.....Saskatoon..... Land Registration District



76-S-01672

**ABBREVIATIONS**

- T—Transfer
- Tr—Transmission
- M—Mortgage
- C—Caveat
- ML—Mechanic's Lien
- TL—Tax Lien
- E—Execution
- N—Notice

Show Other Abbreviations Here

**CERTIFICATE OF TITLE**

Name The City of Saskatoon  
 Land NW 22-37-5-W 3rd

**CHARGES, LIENS AND INTERESTS**

Nature of Instrument	Registration Number	Date of Registration	Date of Instrument	Amount	Particulars	Signature of Registrar	Discharges and Withdrawals		
							Registration Number	Date of Registration	Signature of Registrar
1) <del>Ease-ment</del>	71-S-03466	Feb 22/71	Feb 12/71		As to that portion of the NW $\frac{1}{2}$ described in Instrument No. 71-S-03466, for power line purposes, in favour of the Saskatchewan Power Corporation, Regina, Sask.	<i>[Signature]</i>			
2) <del>Ease-ment</del>	75-S-15535	June 17/75	June 6/75		As to all that ptn. of NW $\frac{1}{2}$ for public utility purposes in favour of Saskatchewan Telecommunications, Regina, Sask., as described in Instrument No. 75-S-15535. By: The City of Saskatoon Address for Service: c/o The City Solicitor, City Hall, Saskatoon, Saskatchewan	<i>[Signature]</i>			
3) <del>C</del>	75-S-31411	Nov 25/75	Nov 20/75		As to all that ptn. of within land described in Inst. 79-S-46769 for public utility purposes, in favour of Saskatchewan Power Corporation, Regina, Sask.	<i>[Signature]</i>	83-S-05361	Feb. 9/83	<i>[Signature]</i>
5) <del>Ease-ment</del>	79-S-46769	Nov. 19/79	Nov. 7/79		All that ptn. of within land described in Inst.No. 81-S-26151 taken for Right of Way purposes in favour of Sask. Power Corporation, Regina, Sask. To: The City of Saskatoon New C. of T. No. 83-S-29140 As to portion shown on Plan No. 83-S-29140.	<i>[Signature]</i>			
6) <del>Ease-ment</del>	81-S-26151	July 24/81	July 13/81		Made by: The Rural Municipality of Corman Park No. 344, Address for Service: 414-20th St. E. Saskatoon, Sask. (As to the N 32 ft throughout except Road Plans 61-S-04840 and 63-S-18647.)	<i>[Signature]</i>			
7) <del>Plan</del>	83-S-29140	Jul 11/83			as to that portion of within land descr. in Inst. 84-S-49516 for pipeline purposes, in favour of: Sask.Power Corporation, Regina, Sask.,	<i>[Signature]</i>			
4) <del>C</del>	76-S-23024	July 21/76	July 21/76		AS TO: E'ly 6m throughout lying West of Plan CW 2950 TO: SaskPower	<i>[Signature]</i>			
Easement	84-S-49516	Dec.11/84	Dec.3/84						
EA	94S12620	14 Apr 94							

Grant No. ....

Ref. 71-S-11456.....

**THIS IS TO CERTIFY** that CANADA CEMENT LaFARGE LTD.

is now the owner of an estate in fee simple

of and in FIRSTLY: The North East Quarter of Section Thirty-five (35),  
in Township Thirty-five (35),  
in Range Four (4),  
West of the Third Meridian,

in the Province of Saskatchewan, in the Dominion of Canada, containing One Hundred and Sixty (160) acres, more or less, EXCEPT: (A) One and Nine Hundred and Eighty-four Thousandth (1.984) acres, more or less, taken for Right of Way and Extra land of the Canadian Pacific Railway, according to a Plan of REcord in the Land Titles Office for the Saskatoon Land Registration District as No. I 5207; (B) All that portion described as Parcel "A" on a Plan of REcord in the said land Titles Office as No. 60-S-15837; (C) Three and Ninety Hundredths (3.90) acres, more or less, taken for Roadway according to a Plan of Record in the said Land Titles Office as No. 71-S-11460; and (D) Five Hundredths (0.05) of a hectare more or less, taken for Roadway according to a Plan of Record in the said land Titles Office as No. 80-S-37847.

MINERALS INCLUDED.

SECONDLY: All Mines and Minerals which may be found to exist within, upon or under: The South East Quarter of Section Thirty-five (35), in said Township and Range, in the Province of Saskatchewan, in the Dominion of Canada, containing One hundred and Sixty (160) acres, more or less, EXCEPT: All that portion described as Parcel "B" on a Plan of REcord in the said land Titles Office as No. 60-S-15839 as same were reserved by Transfer No. 83-S-17485.

**CANCELLED**

**SUBJECT TO THE ENCUMBRANCES, LIENS AND INTERESTS NOTIFIED BY MEMORANDUM NOW OR HEREAFTER UNDERWRITTEN OR ENDORSED HEREON, OR WHICH ATTACH BY IMPLICATION UNDER THE LAND TITLES ACT.**

IN WITNESS WHEREOF I have hereunto subscribed my name and affixed my official seal this .....30th..... day of ..... May ..... A.D. 19 83 .....





M.C. 7,794.00 - LSDs 9 & 10  
Value \$ 7,801.00 - LSDs 15 & 16

No. 90 S 00360

Grant No.

Ref. 83 S 21746

THIS IS TO CERTIFY that LAFARGE CANADA INC.

is now the owner of an estate in fee simple

of and in

**FIRSTLY:**

North East Quarter of Section 35

Township 35

Range 4

West of the Third Meridian, Saskatchewan

160 acres

EXCEPT: (a) 1.984 acres for Right of Way and Extra land of the Canadian Pacific Railway on Plan I 5207.

(b) all that portion as Parcel A, Plan 60 S 15837

(c) 3.90 acres for Roadway, Plan 71 S 11460

(d) 0.05 of a hectare for Roadway, Plan 80 S 37847

**MINERALS INCLUDED**

**SECONDLY:**

All Mines and Minerals within, upon or under

South East Quarter of Section 35,

in said Township and Range

160 acres

EXCEPT: all that portion described as Parcel B on Plan 60 S 15839 as same were reserved by 83 S 17485

**CANCELLED**

**SUBJECT TO** THE ENCUMBRANCES, LIENS AND INTERESTS NOTIFIED BY MEMORANDUM NOW OR HEREAFTER UNDERWRITTEN OR ENDORSED HEREON, OR WHICH ATTACH BY IMPLICATION UNDER THE LAND TITLES ACT. ANY REFERENCE TO AREA IS "MORE OR LESS".

IN WITNESS WHEREOF I have hereunto subscribed my name and affixed my official seal this

3 day of January, A.D. 19 90.

Post Office Address 12th Floor, Southland Tower

10655 Southport Road S.W.

Calgary, Alberta T2W 4Y1

Registrar

Saskatoon Land Registration District

Province of Saskatchewan

NOTICE: The Land Titles Act provides that "every owner or mortgagee shall notify the Registrar of any change in his Post Office Address."

**ABBREVIATIONS**

A of EA - Assignment of Easement  
 ASJT - Application by Surviving Joint Tenant  
 BL - Builders' Lien  
 C - Caveat  
 E - Enlargement  
 EA - Easement  
 M - Mortgage  
 ML - Mechanics' Lien  
 M of EA - Mortgage of Easement  
 N - Notice  
 N to L - Notice to Lapse  
 PP - Postponement  
 R - Renewal  
 T - Transfer  
 TL - Tax Lien  
 TR - Transmission  
 WE - Writ of Execution

**Show Other Abbreviations Here**

C of A - Certificate of Action  
 CCE - Certificate of Chief Engineer  
 JO - Judge's Order  
 MC - Mineral Certificate  
 MO - Maintenance Order  
 MTO - Master of Titles Order  
 PA - Power of Attorney  
 PWA - Party Wall Agreement  
 S of L - Surrender of Lease  
 T of L - Transfer of Lease  
 T of M - Transfer of Mortgage

**CERTIFICATE OF TITLE**

Name Lafarge Canada Inc.  
 Land NE 35-35-4-W3rd etc.

**CHARGES, LIENS AND INTERESTS**

Nature of Instrument	Registration Number	Date of Registration	Amount	Particulars	Signature of Registrar	Discharges and Withdrawals		
						Registration Number	Date of Registration	Signature of Registrar
Cert.	FH 1809	17 May 55		Certificate under The Water Rights Act, as to N½ of NE¼ only.	<i>Perth</i>			
EA	71 S 02835	11 Feb 71		All that ptn. of NE described in Inst. 71 S 02835, for pipe line purposes, in favour of: Sask. Power Corporation, Regina, Sask. Made by: Schmidt Farms Ltd. (As to NE)	<i>Perth</i>			
C	83 S 19893	16 May 83		c/o Gauley & Co., Barristers 300 - 701 Broadway Ave., Saskatoon, Sask. S7K 3L7	<i>Perth</i>			
EA	84 S 28503	4 July 84		as to that ptn. shown in Plan 84 S 02513, taken for right of way purposes, in favour of: Saskatchewan Telecommunications, Regina, Sask.	<i>Perth</i>			
C	89 S 14763	17 Apr 89		Made by: Cannon Inc., c/o MacPherson, Leslie & Co., Barristers, Box 1305, Regina, Sask. S4P 3B8 (as to ptn. Comm. at NW corner of ¼ Sec., then E along N bdry 600 ft., thence S parallel to W bdry 1,242 feet, then W parallel to N bdry to W bdry, then N along W bdry to point of commencement)	<i>Perth</i>			
Postponement	89 S 40286	18 Sept 89		Caveat 83 S 19893 is postponed in favour of Caveat 89 S 14763	<i>Perth</i>			
BL	89 S 51978	4 Dec 89	\$12,882.00	Made by: Earl's Mechanical Insulation Ltd. 316 Maple Street Saskatoon, Sask. S7J 0A5	<i>Perth</i>	90 S 06545	19 Feb 90	<i>Perth</i>
BL	90 S 03483	26 Jan 90	\$197,193.00	Made by: Alta Surety Company (against the estate or interest of Cannon, Inc.) c/o MacPherson Leslie Barristers 1500-410-22nd St. East, Saskatoon, Sask. S7K 1M5	<i>Perth</i>	90 S 21686	1 June 90	<i>Perth</i>
BL	90 S 03484	26 Jan 90	\$65,116.00	Made by: Alta Surety Company (against the estate or interest of Cannon, Inc.) c/o MacPherson Leslie Barristers 1500-410-22nd Street East, Saskatoon, Sask. S7K 5T6	<i>Perth</i>	90 S 21687	1 June 90	<i>Perth</i>
BL	90 S 13121	3 April 90	\$404.14	Made by: Nu-Hawk Distributors Ltd. 313 Jessop Avenue, Saskatoon, SK, S7N 1Y5 (against the estate of Cannon Inc.)	<i>Perth</i>	90 S 24631	21 June 90	<i>Perth</i>
BL	90 S 13123	3 April 90	\$22,378.90	Made by: Krane Service Inc. 331-103rd St., Saskatoon, SK, S7N 1Y9 (against the estate of Cannon Inc.)	<i>Perth</i>	90 S 24632	21 June 90	<i>Perth</i>

CONTINUED ON PAGE 2



M.C. ....

No. 90. S. 00360. ....

Value \$ .....

Grant No. ....

Ref. ....

THIS IS TO CERTIFY that

now the owner of an estate in fee simple  
of and in

**CANCELLED**

~~SUBJECT TO THE ENCUMBRANCES, LIENS AND INTERESTS NOTIFIED BY MEMORANDUM NOW OR  
HEREAFTER UNDERWRITTEN OR ENDORSED HEREON, OR WHICH ATTACH BY IMPLICATION UNDER THE  
LAND TITLES ACT. ANY REFERENCE TO AREA IS "MORE OR LESS".~~

IN WITNESS WHEREOF I have hereunto subscribed my name and affixed my official seal this

..... day of ....., A.D. 19 .....

Post Office Address .....

.....  
.....

 Registrar

NOTICE: The Land Titles Act provides that "every owner or mortgagee shall notify the Registrar of any change in his Post Office Address."

..... Land Registration District  
Province of Saskatchewan



**CERTIFICATE OF TITLE**

**CHARGES, LIENS AND INTERESTS**

**ABBREVIATIONS**

AM - Affidavit of Marriage  
 BL - Builders' Lien  
 C - Caveat  
 CA - Commencement of Action  
 CCE - Certificate of Chief Engineer  
 CON - Consolidation  
 E - Enlargement  
 EA - Easement  
 F - Forfeiture

JO - Judge's Order  
 L - Lease  
 LP - Lis Pendens  
 LDU - Lost Duplicate Certificate of Title  
 M - Mortgage  
 MBO - Mediation Board Order  
 MC - Mineral Certificate  
 MEA - Mortgage of Easement  
 ML - Mechanics' Lien

CERTIFICATE OF TITLE NO. 90S00360

NAME LaFarge Canada Inc.

LAND NE 35-35-4-W3rd

**ABBREVIATIONS**

MO - Maintenance Order  
 MTO - Master of Titles Order  
 N - Notice  
 PA - Power of Attorney  
 PLN - Plan  
 PP - Postponement  
 PPS - Personal Property Security Act Notice  
 PWA - Party Wall Agreement

R - Renewal  
 REP - Replot  
 REQ - Request  
 SJT - Application by Surviving Joint Tenant  
 T - Transfer  
 TI - Transfer of Instrument  
 TL - Tax Lien  
 TR - Transmission  
 WE - Writ of Execution

Nature of Instrument	Registration Number	Date of Registration	Amount	Particulars	Discharges and Withdrawals	
					Registration Number	Date of Registration
C	98MW06993 ✓	29 Apr 98		To: Bart Zimmer Realty Inc. (As to NE ¼ only) 250 1820 8 <sup>th</sup> St East Saskatoon SK S7H 0T6		
E	98MW19332	30 Nov 98		As to: all M & M's only of NE & SE 35-35-4-W3rd Title: 98MW19332		
R	98MW19333	30 Nov 98		Title: 98MW19333		

**CANCELLED**

*B. Murray*  
 \_\_\_\_\_  
 Registrar



Government of  
Saskatchewan  
Saskatoon Land Titles Office

# CERTIFICATE OF TITLE

RENEWAL

M.C.

No. 98MW19333

Value \$ 15,595.00

Grant No.

Ref. 90S00360



THIS IS TO CERTIFY that **LAFARGE CANADA INC.**

Is now the owner of an estate in fee simple

of and in

**The North East Quarter of Section 35**

Township 35

Range 4

West of the **Third Meridian**, Saskatchewan

**160** acres

**EXCEPT:**

**Firstly:** 1.984 acres for Right of Way and Extra land of the Canadian Pacific Railway, Plan I 5207

**Secondly:** Parcel A, Plan 60S15837

**Thirdly:** 3.90 acres, Roadway Plan 71S11460

**Fourthly:** 0.05 of a hectare, Roadway Plan 80S37847

**MINES AND MINERALS EXCEPTED** by 98MW19332

**Plan Ex**

**SUBJECT TO THE ENCUMBRANCES, LIENS, AND INTERESTS NOTIFIED BY MEMORANDUM NOW OR HEREAFTER UNDERWRITTEN OR ENDORSED HEREON, OR WHICH ATTACH BY IMPLICATION PURSUANT TO THE LAND TITLES ACT. ANY REFERENCE TO AREA IS "MORE OR LESS".**

IN WITNESS WHEREOF I have hereunto subscribed my name and affixed my official seal this 30 day of November, 1998

Post Office Address  
12<sup>TH</sup> FLOOR, SUTHERLAND TOWER  
10655 SOUTHPORT ROAD S.W.  
CALGARY AB T2W 4Y1

**NOTICE: The Land Titles Act requires that "every owner or mortgagee shall notify the Registrar of any change in his Post office Address."**

  
\_\_\_\_\_  
Saskatoon Midwest Land Registration District

**CERTIFICATE OF TITLE**

CHARGES, LIENS AND INTERESTS

**ABBREVIATIONS**

AM – Affidavit of Marriage  
 BL – Builders' Lien  
 C – Caveat  
 CA – Commencement of Action  
 CCE – Certificate of Chief Engineer  
 CON – Consolidation  
 E – Enlargement  
 EA – Easement  
 F – Forfeiture  
 JO – Judge's Order  
 L – Lease  
 LP – Lis Pendens  
 LDT – Lost Duplicate Certificate of Title  
 M – Mortgage  
 MBO – Mediation Board Order  
 MC – Mineral Certificate  
 MEA – Mortgage of Easement  
 ML – Mechanics' Lien

CERTIFICATE OF TITLE NO. 98MW19333

NAME **Lafarge Canada Inc.**

LAND NE 35-35-4-W3rd

**ABBREVIATIONS**

MO – Maintenance Order  
 MTO – Master of Titles Order  
 N – Notice  
 PA – Power of Attorney  
 PLN – Plan  
 PP – Postponement  
 PPS – Personal Property Security Act Notice  
 PWA – Party Wall Agreement  
 R – Renewal  
 REP – Replot  
 REQ – Request  
 SJT – Application by Surviving Joint Tenant  
 T – Transfer  
 TI – Transfer of Instrument  
 TL – Tax Lien  
 TR – Transmission  
 WE – Writ of Execution

Nature of Instrument	Registration Number	Date of Registration	Amount	Particulars	Discharges and Withdrawals	
					Registration Number	Date of Registration
CCE	FH 1809	17 May 55		Certificate under the Water Rights Act, As to N ½ of NE ¼ only.		
EA	71S02835	11 Feb 71		As to: Ptn of NE desc in Inst. 71S02835 To: SaskPower		
C	83S19893	16 May 83		By: Schmidt Farms Ltd. c/o: Gauley & Co., Barristers & Solicitors, 300 701 Broadway Ave Saskatoon SK S7K 3L7 (As to NE only)		
EA	84S28503	4 Jul 84		As to: Ptn shown on Pln 84S02513 To: SaskTel		
C	89S14763	17 Apr 89		By: Canron Inc., c/o MacPherson Leslie & Co, Barristers, Box 1305, Regina SK S4P 3B8 (as to Ptn. Comm. at NW corner of ¼ Sec., thence E'ly along N bdry 600 ft; thence S parallel to W bdry 1,242 ft; thence W parallel with N bdry thence N along W bdry to the point of comm. Minerals Excepted)	99MW07453	13 May 99
PP	89S40286	18 Sep 89		Caveat 83S19893 is postponed in favour of Caveat 89S14763	99MW07453	13 May 99
C	90S17457	3 May 90		EASEMENT All that ptn of the most E'ly 663 m. in perp width throughout, being a strip of land 55 m in perp width throughout whose centre line is descr as joining a point on the Eastern boundary 350 m S'ly from Road Section RV PI 71S11460 to a point on the Western boundary 378 m S'ly from the NW corner.		
C	98MW06993	29 Apr 98		By: Bart Zimmer Realty Inc. 250 1820 8 <sup>th</sup> Street East Saskatoon SK S7H 0T6 (As to NE ¼ only)	99MW03533	9 Mar 99
PLN	98MW20997	29 Dec 98		To: Lafarge Canada Inc. Title: 98MW20997 (As to Parcel B, Plan 98MW20997)		

Continued

  
 \_\_\_\_\_  
 Registrar

**CERTIFICATE OF TITLE**

CHARGES, LIENS AND INTERESTS

**ABBREVIATIONS**

AM – Affidavit of Marriage  
 BL – Builders' Lien  
 C – Caveat  
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JO – Judge's Order  
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 M – Mortgage  
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 MC – Mineral Certificate  
 MEA – Mortgage of Easement  
 ML – Mechanics' Lien

CERTIFICATE OF TITLE NO. 98MW19333

NAME **Lafarge Canada Inc.**

LAND **NE 35-35-4-W3rd**

**ABBREVIATIONS**

MO – Maintenance Order  
 MTO – Master of Titles Order  
 N – Notice  
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 PLN – Plan  
 PP – Postponement  
 PPS – Personal Property Security Act Notice  
 PWA – Party Wall Agreement

R – Renewal  
 REP – Replot  
 REQ – Request  
 SJT – Application by Surviving Joint Tenant  
 T – Transfer  
 TI – Transfer of Instrument  
 TL – Tax Lien  
 TR – Transmission  
 WE – Writ of Execution

Nature of Instrument	Registration Number	Date of Registration	Amount	Particulars	Discharges and Withdrawals	
					Registration Number	Date of Registration
C	99MW02590	18 Feb 99		Restrictive Covenant By: Lafarge Canada Inc. c/o Mc Kercher Mc Kercher & Co., 300 374 3 <sup>rd</sup> Avenue South SASKATOON SK 7K 1M5 Att: Lorne Larson		
C	99MW02897	24 Feb 99		Easement By: Bart Zimmer Realty Inc., 250 1820 8 <sup>th</sup> St. East Saskatoon SK S7H 0T6		

  
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**Appendix F**  
**Previous Environmental Reports**



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- Asphalt Testing



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**PHASE II ENVIRONMENTAL SITE ASSESSMENT  
PORTIONS OF NW AND NE 35-35-4-W3M  
RURAL MUNICIPALITY OF CORMAN PARK,  
SASKATCHEWAN  
PMEL FILE NO. S09-6802  
FEBRUARY 13, 2009**

**PREPARED FOR:**

**FRP MANUFACTURING INC.  
R.R. 35 SUITE 501, BOX 11  
SASKATOON, SASKATCHEWAN  
S7K 3J8**

**ATTENTION: MR. TREVOR HEWISON**

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## 5.0 DISCUSSION OF RESULTS

### 5.1 Soil

Based on the soil vapour concentrations; the results of laboratory chemical analysis on soil samples analysed; and observations (visual and olfactory) made during drilling, the soil in the area of the investigation has not been adversely impacted by releases (if any) of metals and/or VOC's associated with the (resin) AST. Soil vapour concentrations were low and the concentrations of chemical constituents measured in the soil samples analysed were below the CCME (2007) Agricultural Criteria. No staining and/or adverse odours were apparent in the soil samples collected during drilling.

### 5.2 Groundwater

The concentrations of VOC's measured the groundwater samples collected at the site were below the AENV (2008) Agricultural Groundwater Criteria and laboratory detection limits. The concentrations of dissolved Arsenic, Selenium and Uranium measured in the groundwater samples collected from the monitoring wells installed in Test Holes Nos. 09-1 and 09-2 were slightly above the AENV (2008) Agricultural Groundwater Criteria. This is likely a representation of background concentrations and/or due to the sampling methods employed since these parameters are not found in the resin used at the site.

## 6.0 CLOSURE

The presentation of the summary of the field drill logs and subsurface environmental considerations has been completed as authorized. Three (3) test holes were drilled at the site using our truck and track-mounted continuous flight auger drilling rigs. Field drill logs were compiled during drilling, which, we believe are representative of the subsurface conditions at the Test Hole locations at the time of test drilling. Variations in the subsurface conditions from that shown on the field drill logs at locations other than the exact Test Hole locations should be anticipated. It should be recognized that the subsurface conditions and soil/groundwater chemistry reported here may change with time at any specific test locations and may be different at locations other than the exact sampling locations.

The subsurface investigation necessitated the drilling of deep test holes. Please be advised that some settlement of the backfill material will occur which may leave a depression or an open hole. It is the responsibility of the client to inspect the site and backfill, as required, to ensure that the ground surface at each Test Hole location is maintained level with the existing grade. It is also the responsibility of the client to decommission monitoring wells installed at the site in accordance with applicable regulations and guidelines.

The Phase II ESA report has been prepared for the exclusive use of FRP Manufacturing Inc., Saskatchewan Ministry of Environment and their agents for specific application to Portions of NE and NW 35-35-4-W3M, located in the Rural Municipality of Corman Park, Saskatchewan. It has been prepared in accordance with generally accepted geoenvironmental engineering practices and no other warranty, express or implied, is made. Any use which a Third Party makes of this report, or any reliance on decisions to be made based on it, are the responsibility of such Third Parties. P. Machibroda Engineering Ltd. accepts no responsibility for damages, if any, suffered by any Third Party as a result of decisions made or actions based on this report.

If this report has been transmitted electronically, it has been digitally signed and secured with personal passwords to lock the document. Due to the possibility of digital modification, only originally signed reports and those reports sent directly by PMEL can be relied upon without fault.

We trust that this report fulfills your requirements for this project. Should you require additional information, please contact us.

**P. MACHIBRODA ENGINEERING LTD.**

*Catherine Burrows*  
Catherine Burrows, Engineer-In-Training



Ray Machibroda, P. Eng., M.Sc.  
CB:RM:zz

Association of Professional Engineers & Geoscientists of Saskatchewan		
<b>CERTIFICATE OF AUTHORIZATION</b>		
P. MACHIBRODA ENGINEERING LTD.		
Number 172		
Permission to Consult field by:		
Discipline	Sk. Reg. No.	Signature
Geoenvironmental	668	<i>[Signature]</i>
		<i>[Signature]</i>





PROJECT:                   **PHASE II ENVIRONMENTAL SITE ASSESSMENT**  
                                  **304140 TOWNSHIP ROAD 360**  
                                  **NE ¼ 35-35-04 W3M**  
                                  **RM OF CORMAN PARK, SASKATCHEWAN**

PREPARED FOR:         **101046965 SASKATCHEWAN LTD.**





Government  
— of —  
Saskatchewan

**Ministry of Environment**

102 -112 Research Drive  
Saskatoon SK S7N 3R3  
Phone 306-933- 6544  
Facsimile 306-933-8442

November 6, 2014

File: 2008-0530

101046965 Saskatchewan Ltd.  
**Attn:** Dan Beaulac  
Rural Route 6, Site 601 BOX 103  
SASKATOON, SK S7K 3J9

Mr. Beaulac:

The Ministry of Environment has received the Closure Report entitled "Phase II Environmental Site Assessment (ESA) Report, Township Road 360, NE ¼ 35-35-04 W3M" and dated October 17, 2014. This report was prepared on behalf of 101046965 Saskatchewan Ltd. for the site located at NE ¼ 35-35-04 W3M near the City of Saskatoon, Saskatchewan.

Based on the information provided and recognizing the inherent limitations of the methods employed, the site is deemed to be compliant with current provincial environmental standards.

Please note that the position of the ministry as described in this letter is based on the information provided within the scope of the submission and obtained through methodology with inherent limitations. Actions at the site without the ministry's knowledge and approval may influence the environmental status of the land. This letter does not absolve any party from the potential of future liability for further remediation of this site in situations where either the land use may change or additional concerns arise from the contaminants remaining on/off-site.

Sincerely,

A handwritten signature in blue ink, appearing to read "Arash Janfada", written over a horizontal line.

Arash Janfada  
Environmental Project Officer



17 October 2014

File: 14-1607-2

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101046965 Saskatchewan Ltd.  
Rural Route 6, Site 601, Box 103  
Saskatoon, SK S7K 3J9

Attention: Mr. Dan Beaulac

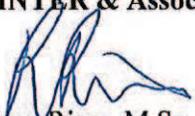
**Subject: Phase II Environmental Site Assessment (ESA) Report  
304140 Township Road 360  
NE ¼ 35-35-04 W3M  
RM of Corman Park, Saskatchewan**

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PINTER & Associates Ltd. (PINTER) is pleased to enclose a copy of the Phase II ESA report for the property located at 304140 Township Road 360, RM of Corman Park, Saskatchewan.

If you have any questions or concerns regarding our findings, please do not hesitate to contact the undersigned at: (306)-244-1710.

Yours Sincerely,  
**PINTER & Associates Ltd.**



Ryan Riess, M.Sc., P. Eng.  
Project Manager

h:\projects\1607 fip manufacturing inc\1607-2 fip mufacturing - sampling prgrm dvl\pinn\1607-2 report\drafts\1607-2 fip sampling program - 15oct 14 - wrrr\_lhtw.docx

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710A-48<sup>th</sup> Street East  
Saskatoon, SK S7K 5B4

Email: [pintermain@pinter.ca](mailto:pintermain@pinter.ca)

Ph: 306 244-1710  
Fx: 306 933-4986

**PHASE II ENVIRONMENTAL SITE ASSESSMENT  
304140 TOWNSHIP ROAD 360  
NE ¼ 35-35-04 W3M  
RM OF CORMAN PARK, SASKATCHEWAN**

**Prepared For:  
101046965 SASKATCHEWAN LTD.**

**Prepared By:  
PINTER & ASSOCIATES LTD.**

**17 October 2014  
File: 14-1607-2**



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## **Executive Summary**

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PINTER & Associates Ltd. (PINTER) was retained by Dan Beulac of 101046965 Saskatchewan Ltd, to perform a Phase II Environmental Site Assessment (ESA) at 304140 Township Road 360 NE-35-35-04-W3M, Rural Municipality (RM) of Corman Park, Saskatchewan (the Site).

The scope of work included submitting a sampling plan, based on Visual Sampling Plan (VSP) software, to Saskatchewan Ministry of Environment (SMOE) and obtaining SMOE's approval of the sampling program and staged format of the Phase II ESA. Also included in the scope of work is collecting and submitting soil samples for laboratory analysis to establish current environmental conditions at the Site.

Sampling locations were based on a grid developed by VSP software. All samples submitted for laboratory analysis contained concentrations of BTEX, Styrene, and Phenols below laboratory detection limits and the applicable criteria. No further work is required.

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**FIGURES**

- 1 Site Location
- 2 Site Layout

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- A Summary of Site and Surrounding Area Zoning and Land Use 2

**APPENDICES**

- A Figures
- B Selected Site Photos
- C Tables
- D Water Well Driller Records
- E Laboratory Analytical Results
- F NCSCS Prescreen

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## **1.0 INTRODUCTION**

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PINTER & Associates Ltd. (PINTER) was retained by 101046965 Saskatchewan Ltd. to perform a Phase II Environmental Site Assessment (ESA) on the site located at 304140 Township Road 360 in the RM of Corman Park, Saskatchewan (SK) (the Site). Figure 1 (Appendix A) presents the Site Location.

The Saskatchewan Ministry of Environment (SMOE) required a detailed Phase II ESA of the entire property to address concerns related to historical incidents on the property. These included an unauthorized release of liquids offsite to the west in July 2008, the burning of fiberglass on the property in April 2009, and the manufacturing facility burning down in December 2009. The offsite area was previously addressed by PINTER in fall 2012.

The objective of the Phase II ESA was to determine the current environmental conditions for soil conditions at the Site based on the results of a Visual Sample Plan (VSP). Soil samples collected during the Phase II ESA were analyzed for BTEX, Styrene and Phenols.

### **1.1. SCOPE OF WORK**

The scope of work included the following:

- *Present the plan to SMOE and obtain SMOE's approval of the sampling program and the Staged approach.*
- *Complete a surface sampling program consisting of the sampling of at least forty (40) sampling locations.*
- *Prepare a report documenting the Phase II ESA activities.*
- *Prepare a Stage II ESA Plan, if required.*

### **1.2. SITE DESCRIPTION**

The Site is described as 304140 Township Road 360 and is comprised of an approximately 65,000 square metre (m<sup>2</sup>) fenced industrial lot located in the RM of Corman Park, near Saskatoon, SK. Figure 2 presents the Site layout. There is a two storey commercial building currently standing on the site. There is also a concrete slab left over from a demolished commercial building to the north and east of the

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existing structure. Temporary mobile trailers are currently located on the concrete pad east of the two storey commercial structure. The area to the west and south of the main structure is used for RV storage. Selected site photographs are presented in Appendix B.

**1.2.1. Site and Adjacent Land Use**

The Site is located in the Floral Industrial Park. All surrounding lands are zoned as industrial. Table 1 presents a summary of on-Site and adjacent land uses.

**Table 1: Summary of Site & Adjacent Land Use**

<b>Direction from Site</b>	<b>Present Land Use</b>
Site	RV Storage
North	Vacant
South	Vacant Industrial
East	Industrial
West	Being Developed

**1.2.2. Regional Topography and Surface Water**

The topography of the Site is primarily flat with surface drainage toward the north east in the northeastern portion of the Site and toward the west in the southern and middle portions of the Site. The nearest surficial body of water is Patience Lake located approximately 9,000 m northeast of the Site. Multiple unnamed marshlands and dugouts are located in the area with the closest being approximately 100 m north of the Site.

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## **2.0 METHODOLOGY**

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Site investigation activities were completed from 4 September to 5 September 2014. Prior to the commencement of daily activities on the Site, PINTER completed a Site-Specific Health and Safety assessment to identify on-Site hazards and project health and safety requirements.

### **2.1. SAMPLING PROGRAM**

PINTER personnel supervised the advancement of forty (40) sampling locations on 4 and 5 September 2014 to establish soil quality across the Site. Sampling locations were based on a combination of the grid pattern described by the VSP software and historical knowledge of the Site. Where possible, sampling locations were selected based on previously known areas of concern as well as visible surficial indicators.

Site boundaries were used in the VSP to create tight grid spacing and a reasonable number of sample locations. VSP software determined that in order to have a 95% probability of locating a circular hot spot with a radius of 22 m, 40 sampling locations would be required. To achieve these results, VSP software applied a triangular grid pattern to the sampling area. Sample locations were plotted in the field based on the VSP software. Sample locations in the field that deviated from the VSP plan did so due to physical constraints, utilities, historical knowledge of contaminants, or visual observations.

A 0.3 m sampling depth was chosen due to the surficial nature of releases that were historically identified to be on or burnt at the Site. BTEX, Styrene and Phenols were selected for analysis due to their common presence as a byproduct of the burning of fiberglass. Analyzing samples for these six contaminants covers the top 3 byproducts of burning fiberglass listed by weight, and six of the top seven (Lemieux et al., 2004).

Prior to the initiation of ground disturbance activities, underground utility locates were requested from Saskatchewan 1<sup>st</sup> Call which included SaskTel, SaskPower, and SaskEnergy. All sampling locations were identified to be clear of underground utilities.

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**2.2. SAMPLING METHODOLOGY**

Representative soil samples for combustible vapour concentrations (CVC) & volatile organic compound (VOC) screening were collected at approximate 0.3 m below ground surface (bgs). Portions of the recovered soil samples were placed in laboratory supplied 125 millilitre (mL) glass jars equipped with Teflon<sup>®</sup> lids with zero headspace for potential laboratory analysis. The sample jars were labeled according to a pre-determined sample identification protocol and kept cool in an ice-chilled cooler until they were transferred to the laboratory.

A portion of selected soil samples were placed and sealed in a polyethylene laboratory grade soil bag with equal volume headspace for CVC/VOC screening. The bagged samples were warmed to ambient temperature before analysis. The ambient headspace inside the bags was then analyzed with an RKI Eagle vapour analyzer operating in methane elimination mode and calibrated to a known hexane standard. Instrument calibration was completed daily prior to the commencement of work with a known calibration gas concentration of 15% Lower Explosive Limit (LEL) until the reading was within 0% of the known concentration.

**2.3. SURVEY DATA**

Sampling locations were surveyed horizontally and vertically with a Hemisphere S320 GNSS GPS Survey Receiver system. Major Site features were also surveyed to aid in the development of Site drawings.

**2.4. LABORATORY ANALYSIS**

**2.4.1. Soil**

Based on field screening results and visual observation, a total of 44 soil samples including four blind duplicates for quality assurance/quality control (QA/QC) purposes were selected and submitted for laboratory analysis of BTEX, Styrene and Phenols. All samples were submitted to ALS Canada Limited (ALS) Laboratories located in Saskatoon, SK. ALS's Saskatoon laboratory is accredited by the Canadian Association for Laboratory Accreditation (CALA).

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**2.5. NATIONAL CLASSIFICATION SYSTEM FOR CONTAMINATED SITES  
(NCSCS) REVIEW**

A National Classification System for Contaminated Sites (NCSCS) pre-screening checklist and score sheet must be completed for any site investigated which may have impacts above applicable criteria (CCME, 2010).

---

## 3.0 RESULTS

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### 3.1. WATER WELL SEARCH

A water well search was conducted on 24 September 2014 by reviewing the Saskatchewan Water Security Agency (SWSA) Water Well Information Database (SWSA, 2014). The search was performed within 800 m of the Site, however not all well records may be included in the database. The search identified ten water wells potentially located within 800 m of the Site. The distance and direction to the water wells was not determined as the database specifies locations of the water wells to the nearest quarter section. The water well completion depths ranged between 6.7 and 977.4 m bgs with static water levels ranging between 3.0 and 6.1 m bgs. Table 1, Appendix C presents a summary of the water well search results. Appendix D presents copies of the Water Well Drillers Records.

### 3.2. APPLICABLE REGULATORY GUIDELINES

Industrial guidelines are applicable to the Site due to its zoning. The guidelines used to compare the results of the laboratory analyses included the following:

#### Soil Guidelines

- Saskatchewan Ministry of Environment (SMOE) *Saskatchewan Environmental Quality Guidelines*, (SMOE, 2014). In order to be conservative, fine-grained criteria was applied for each parameter.

### 3.3. SURFICIAL OBSERVATIONS

Dark soils were observed near sample location eight (8). Some light surficial staining was identified near sample location 25. Fiberglass was found at surface in the area of sampling locations 30 and 34. Some small traces of fiberglass were noted at surface near the concrete building slab. Dark stains were present on the northwestern portion of the concrete slab.

Hardened resin was identified in between the old loading docks and the concrete building slab. The ground in this area was hardened and impenetrable by hand auger. Sample location 14 is located immediately adjacent to the west of the hardened resin.

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**3.4. LABORATORY ANALYTICAL RESULTS – SOIL**

The Certificates of Analysis from ALS for the soil samples are presented in Appendix E.

**3.4.1. Petroleum Hydrocarbons**

Laboratory analytical results for BTEX and PHC Fractions F1 to F4 in soil, are presented in Table 2, Appendix C.

All soil samples submitted for laboratory analysis of BTEX were below the laboratory detection limits and applicable SMOE 2014 guidelines.

**3.4.2. Styrene & Phenols Analysis**

Laboratory analytical results for Styrene & Phenols in soil are presented in Table 2 located in Appendix C.

All soil samples submitted for laboratory analysis of Styrene and Phenols were below the laboratory detection limits and applicable SMOE 2014 guidelines.

**3.5. QUALITY ASSURANCE AND QUALITY CONTROL**

A QA/QC program was implemented during soil and groundwater sampling to minimize and quantify impacts introduced during sample collection, handling, shipping and analysis.

As part of the QA/QC program, sampling protocols included; minimizing sample handling, using dedicated clean sampling equipment, sample specific identification and labeling procedures and utilizing laboratory provided Chain-of-Custody (COC) records.

Blind duplicate samples of soil were submitted for laboratory analysis to assess potential sampling or laboratory error. For duplicate samples, the Relative Percent Difference (RPD) is calculated to assess the closeness of the results from the two samples. RPDs are calculated as follows:

$$\text{Where, } \text{RPD (\%)} = 100\% \times \text{ABS (X - Y)} / [(X + Y)/2]$$

X = the concentration of the original sample

Y = the concentration of the blind field duplicate sample

ABS = Absolute Difference

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Laboratory QA/QC measures included analysis of laboratory blank, spiked blank, duplicate, matrix spike, and laboratory control samples.

RPD values were not calculated because all samples had concentrations below detection limits.

**3.6. NATIONAL CLASSIFICATION SYSTEM FOR CONTAMINATED SITES (NCSCS) REVIEW**

A NCSCS pre-screening checklist and score sheet must be completed for any site investigated which may have impacts above criteria. Appendix F presents the NCSCS pre-screening checklist. The Site had no criteria exceedances and therefore does not require a NCSCS review.

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## **4.0 CONCLUSIONS**

---

The results of the Phase II ESA are summarized below:

- The Site is currently used for storage. Industrial land use guidelines were applied across the Site.
- Laboratory analytical results for soil contained concentrations of BTEX were below the applicable SMOE 2014 guidelines.
- Laboratory analytical results for soil contained concentrations of Styrene & Phenols below the applicable SMOE 2014 guidelines.
- A review of QA/QC measures determined that data quality was reliable.
- No further work is required.

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## **5.0 REFERENCES**

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- Canadian Council of Ministers of the Environment (CCME). 2010. “*National Classification System for Contaminated Sites Guidance Document.*”, Available at: [http://www.ccme.ca/files/Resources/csm/pn\\_1403\\_ncscs\\_guidance\\_e.pdf](http://www.ccme.ca/files/Resources/csm/pn_1403_ncscs_guidance_e.pdf) [accessed October 15, 2014]
- Google Earth. 2014. Available at: <http://www.google.com/earth/index.html> [accessed September 24, 2014]
- Lemieux, Paul M., Lutes, Christopher C., Santoianni, Dawn A. 2003. “*Emissions of organic air toxics from open burning: a comprehensive review.*” *Progress in Energy and Combustion Science* 30 (2004) 1-32. Available at: <http://www.sciencedirect.com/science/article/pii/S0360128503000613> [accessed October 15, 2014]
- Saskatchewan Water Security Agency. 2014. Online Water Well Information Database. Available at: <https://gis.wsask.ca/> [accessed September 24, 2014]

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## **6.0 LIMITATIONS**

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In conducting this investigation on Site and in rendering our findings and conclusions on the presence and/or level of impacts present, PINTER & Associates Ltd. gives the benefit of its best judgment based on its experience and in accordance with generally accepted professional standards for this type of assessment. Our conclusions are limited by the following:

- The agreed scope of work requested to be undertaken;
- It was not feasible to sample or test for chemical constituents at each and every location on the site. Site-specific criteria were used during sampling and testing and are thought to be representative of present site conditions;
- Our conclusions are drawn from the information provided to PINTER & Associates Ltd., in whole or in part, during the course of this environmental site investigation and have been included in this report.

Performance of a standardized environmental site assessment is intended to reduce, but not wholly eliminate, uncertainty regarding the potential for recognized environmental conditions in connection with the property, given reasonable limits of time and cost.

PINTER will not be responsible or held liable for any existing contamination or adverse impacts on the study area that have not been caused by its activities. Actions at the Site without PINTER's knowledge may influence the environmental status of the property. No warranty, expressed or implied is given concerning the current environmental condition of the Site following the submission of the original report dated 17 October 2014.

No warranty, expressed or implied, is given concerning chemicals of concern at the Site. This report has been prepared for the exclusive use of 101046965 Saskatchewan Ltd. Without any mitigation or remediation the contaminant conditions on the Site can change from that described in this report. Any use that a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. PINTER & Associates Ltd. accepts no responsibility for damages, if any suffered by any third party, as a result of decisions made or actions based on this report.

**CONFIDENTIAL**

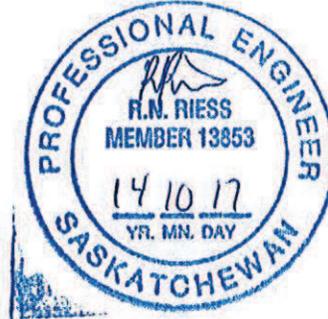
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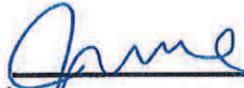
## 7.0 CLOSURE

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This report has been prepared by PINTER for the exclusive use of FRP Manufacturing pursuant to the Limitations presented in Section 7.0.

PINTER & Associates Ltd.



*for*   
Wesley Wizniuk, E.I.T.  
Project Engineer

---

Ryan Riess, M.Sc., P.Eng.  
Project Manager

Association of Professional Engineers & Geoscientists of Saskatchewan		
CERTIFICATE OF AUTHORIZATION		
Pinter & Associates Ltd.		
Number C1232		
Permission to Consult held by:		
Discipline	Sk. Reg. No.	Signature
<u>Env</u>	<u>13853</u>	<u>RRiess</u>



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## **Appendix A**

**Figures**



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**Appendix B**  
**Selected Site Photos**



**Figure 1: Main road and concrete building pad looking northeast.**



**Figure 2: Storage in the southwest area of the site, looking southwest**



**Figure 3: Dark stains on concrete pad, looking east**



**Figure 4: Two piles of concrete rubble along the west site boundary, looking northwest.**



Figure 5: Sampling location 17 (marked with pin flag) looking east.



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## **Appendix C**

**Tables**

**TABLE 1: Summary of Saskatchewan Water Security Agency Water Well Information Database Search**

Record No.	Well Location	Intended Use	Well Properties			Stratigraphic Description
			Water Struck Depth (m)	Screen Interval (m)	Date Installed	
31749	SE35-35-04-W3M	Domestic	3.0	N/A	01/07/1935	
31768	NE35-35-04-W3M	Industrial	N/A	N/A	N/A	Topsoil, Clay to 21.3m, Sandy clay to 27.4m, Clay to 30.2m, Limestone to 30.5m, Clay to 31.4m, Sandy Clay to 37.2m, Clay to 75.3m, Gravel to 75.6m, Clay to 78.0m, Shale to 112.8m.
31769	SW02-36-04-W3M	Domestic	6.1	N/A	19/08/1950	Sand 6.7m.
52944	NE35-35-04-W3M	Domestic	5.5	N/A	04/29/1964	N/A
71256	NE35-35-04-W3M	Domestic	N/A	N/A	05/06/1982	Topsoil, Clay to 12.2m.
90913	SW-02-36-04-W3M	Domestic	5.8	63.4 - 66.4	10/06/1988	Clay to 5.5m, Till to 27.4m, Gravel to 29.9m, Till to 50.9m, Sandy Clay to 53.6m, Clay to 62.8m, Gravel to 66.4m, Clay to 67.7m.
220240	SW-02-36-04-W3M	Unkown	N/A	N/A	N/A	N/A
66537	NE34-35-04-W3M	Domestic	N/A	1.5 - 32.0	04/23/1981	Clay to 30.5m
108665	SE35-35-04-W3M	Domestic	4.8	30.3 - 35.1	07/30/1997	Clay to 10.1m, Till to 29.9m, Sand to 35.1m, Till to 36.6m.
220552	SW02-36-04-W3M	N/A	N/A	N/A	07/05/1952	N/A

TABLE 2: Summary of Soil Analytical Results

Sample Location	Sample ID	ALS Sample ID	Date Sampled (dd mm yyyy)	Depth Interval (m)	Combustible Vapour Concentration (ppm)	Monocyclic Hydrocarbons					
						Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	Styrene (mg/kg)	Phenols (mg/kg)
Method Detection Limit						0.05	0.05	0.01	0.1	0.05	0.1
1	HAH-1-B	L1516163-1	04-09-2014	0.3	-	<0.005	<0.05	<0.01	<0.10	<0.050	<0.10
2	HAH-2-B	L1516163-2	04-09-2014	0.3	-	<0.005	<0.05	<0.01	<0.10	<0.050	<0.10
3	HAH-3-B	L1516163-3	04-09-2014	0.3	-	<0.005	<0.05	<0.01	<0.10	<0.050	<0.10
4	HAH-4-B	L1516163-4	04-09-2014	0.3	-	<0.005	<0.05	<0.01	<0.10	<0.050	<0.10
5	HAH-5-B	L1516163-5	04-09-2014	0.3	-	<0.005	<0.05	<0.01	<0.10	<0.050	<0.10
6	HAH-6-B	L1516163-6	04-09-2014	0.3	-	<0.005	<0.05	<0.01	<0.10	<0.050	<0.10
7	HAH-7-B	L1516163-7	04-09-2014	0.3	-	<0.005	<0.05	<0.01	<0.10	<0.050	<0.10
8	HAH-8-B	L1516163-8	04-09-2014	0.3	-	<0.005	<0.05	<0.01	<0.10	<0.050	<0.10
9	HAH-9-B	L1516163-9	04-09-2014	0.3	-	<0.005	<0.05	<0.01	<0.10	<0.050	<0.10
10	DUPE-9	L1516163-10	04-09-2014	0.3	-	<0.005	<0.05	<0.01	<0.10	<0.050	<0.10
11	HAH-10-B	L1516163-11	04-09-2014	0.3	-	<0.005	<0.05	<0.01	<0.10	<0.050	<0.10
12	HAH-11-B	L1516163-12	04-09-2014	0.3	-	<0.005	<0.05	<0.01	<0.10	<0.050	<0.10
13	HAH-12-B	L1516163-13	04-09-2014	0.3	-	<0.005	<0.05	<0.01	<0.10	<0.050	<0.10
14	HAH-13-B	L1516163-14	05-09-2014	0.3	-	<0.005	<0.05	<0.01	<0.10	<0.050	<0.10
15	HAH-14-B	L1516163-15	05-09-2014	0.3	-	<0.005	<0.05	<0.01	<0.10	<0.050	<0.10
16	DUPE-14	L1516163-21	05-09-2014	0.3	-	<0.005	<0.05	<0.01	<0.10	<0.050	<0.10
17	HAH-15-B	L1516163-16	05-09-2014	0.3	-	<0.005	<0.05	<0.01	<0.10	<0.050	<0.10
18	HAH-16-B	L1516163-17	05-09-2014	0.3	-	<0.005	<0.05	<0.01	<0.10	<0.050	<0.10
19	HAH-17-B	L1516163-18	05-09-2014	0.3	-	<0.005	<0.05	<0.01	<0.10	<0.050	<0.10
20	HAH-18-B	L1516163-19	05-09-2014	0.3	-	<0.005	<0.05	<0.01	<0.10	<0.050	<0.10
21	HAH-19-B	L1516163-20	05-09-2014	0.3	-	<0.005	<0.05	<0.01	<0.10	<0.050	<0.10
22	HAH-20-B	L1516163-22	05-09-2014	0.3	-	<0.005	<0.05	<0.01	<0.10	<0.050	<0.10
23	HAH-21-B	L1516163-23	05-09-2014	0.3	-	<0.005	<0.05	<0.01	<0.10	<0.050	<0.10
24	HAH-22-B	L1516163-24	05-09-2014	0.3	-	<0.005	<0.05	<0.01	<0.10	<0.050	<0.10
25	HAH-23-B	L1516163-25	05-09-2014	0.3	-	<0.005	<0.05	<0.01	<0.10	<0.050	<0.10
26	HAH-24-B	L1516163-26	05-09-2014	0.3	-	<0.005	<0.05	<0.01	<0.10	<0.050	<0.10
27	HAH-25-B	L1516163-27	05-09-2014	0.3	-	<0.005	<0.05	<0.01	<0.10	<0.050	<0.10
28	HAH-26-B	L1516163-28	05-09-2014	0.3	-	<0.005	<0.05	<0.01	<0.10	<0.050	<0.10
29	HAH-27-B	L1516163-29	05-09-2014	0.3	-	<0.005	<0.05	<0.01	<0.10	<0.050	<0.10
30	HAH-28-B	L1516163-30	05-09-2014	0.3	-	<0.005	<0.05	<0.01	<0.10	<0.050	<0.10
31	HAH-29-B	L1516163-31	05-09-2014	0.3	0	<0.005	<0.05	<0.01	<0.10	<0.050	<0.10
32	DUPE-29-B	L1516163-32	05-09-2014	0.3	-	<0.005	<0.05	<0.01	<0.10	<0.050	<0.10
33	HAH-30-B	L1516163-33	05-09-2014	0.3	5	<0.005	<0.05	<0.01	<0.10	<0.050	<0.10
34	HAH-31-B	L1516163-34	05-09-2014	0.3	0	<0.005	<0.05	<0.01	<0.10	<0.050	<0.10
35	HAH-32-B	L1516163-35	05-09-2014	0.3	0	<0.005	<0.05	<0.01	<0.10	<0.050	<0.10
36	HAH-33-B	L1516163-36	05-09-2014	0.3	0	<0.005	<0.05	<0.01	<0.10	<0.050	<0.10
37	HAH-34-B	L1516163-37	05-09-2014	0.3	0	<0.005	<0.05	<0.01	<0.10	<0.050	<0.10
38	HAH-35-B	L1516163-38	05-09-2014	0.3	5	<0.005	<0.05	<0.01	<0.10	<0.050	<0.10
39	HAH-36-B	L1516163-39	05-09-2014	0.3	0	<0.005	<0.05	<0.01	<0.10	<0.050	<0.10
40	HAH-37-B	L1516163-40	05-09-2014	0.3	0	<0.005	<0.05	<0.01	<0.10	<0.050	<0.10
41	HAH-38-B	L1516163-41	05-09-2014	0.3	5	<0.005	<0.05	<0.01	<0.10	<0.050	<0.10
42	HAH-39-B	L1516163-42	05-09-2014	0.3	5	<0.005	<0.05	<0.01	<0.10	<0.050	<0.10
43	DUPE-39-B	L1516163-43	05-09-2014	0.3	-	<0.005	<0.05	<0.01	<0.10	<0.050	<0.10
44	HAH-40-B	L1516163-44	05-09-2014	0.3	0	<0.005	<0.05	<0.01	<0.10	<0.050	<0.10
<b>Applicable Guidelines</b>											
SMOE (2014) - Saskatchewan Environmental Quality Guidelines						0.046	0.52	0.11	15	0.68	0.007

Associated ALS File L1516163

All terms defined in body of PINTER report.

<sup>a</sup> Field screening results are measured using a combustible gas meter calibrated to a hexane standard.

<sup>b</sup> Saskatchewan Ministry of Environment (SMOE) Environmental Quality Guidelines, Fine Grained, Industrial.

< Denotes concentrations less than indicated detection limit.

**BOLD** Concentration greater than or equal to applicable industrial guidelines





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## **Appendix D**

**Water Well Driller Records**



<b>CANADA CEMENT</b>		Completion	
		RM	
		Major Basin <b>06</b>	
		SubBasin <b>30</b>	
		NTS Map <b>73B00</b>	
WWDR#	<b>031768</b>		

<b>Well Location</b>							
LSD	Quarter	Section	Township	Range	Meridian	Reserve	Riverlot
<b>00</b>	<b>NE</b>	<b>35</b>	<b>035</b>	<b>04</b>	<b>3</b>		
							Location of Well (in Quarter)
							<b>0.00</b> ft from N/S Boundary
Zone	Easting	Northing	Source	Accuracy			
							<b>0.00</b> ft from E/W Boundary

<b>Well Information</b>							
Driller #	<b>INTERNATIONAL WATER SUPPLY LTD</b>						
Water Use	<b>Industrial</b>						
Hole #							
Well Use	<b>Water Test Hole</b>	Well Casings					
Installation Method	<b>Drilled</b>	Length (ft)	Btm (ft)	Dia (in)	Description		
Depth	<b>370.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>		
Water Level	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>		
Bit	<b>4.70</b>	Screens					
Flowing Head	<b>0.00</b>	Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description	
		<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	
		<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	
		<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	
<b>Pump Test</b>							
Draw Down	<b>0.00</b> ft						
Duration	<b>0.00</b> hrs	Elevation	<b>1,700.00</b> ft	Aquifer			
Pumping Rate	<b>0.00</b> igpm	Rec. Pumping Rate	<b>0.00</b>	E-Log	<b>No</b>		
Temp	<b>0.00</b> deg. F	Intake	<b>0.00</b>	Phys	<b>E03</b>		

<b>Lithology List</b>			
<b>Depth (ft)</b>	<b>Material</b>	<b>Colour</b>	<b>Description</b>
1.00	Topsoil	Unknown	Unknown
20.00	Clay	Brown	Stoney
70.00	Clay	Grey	Stoney
90.00	Sandy Clay	Grey	Soft
99.00	Clay	Grey	Boulders
100.00	Limestone	Unknown	Unknown
103.00	Clay	Grey	Stoney
122.00	Sandy Clay	Unknown	Silty
247.00	Clay	Grey	Boulders
248.00	Gravel	Unknown	Unknown
256.00	Clay	Grey	Stoney
280.00	Shale	Unknown	Unknown



## Water Well Driller's Report

370.00	Shale	Unknown	Sand Streaks
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**XPLORE IT DRILLING LTD**

 Completion **07/17/1975**

 WWDR# **043763**

 RM  
 Major Basin **06**  
 SubBasin **30**  
 NTS Map **73B00**
**Well Location**

LSD	Quarter	Section	Township	Range	Meridian	Reserve	Riverlot	
<b>00</b>	<b>SE</b>	<b>03</b>	<b>036</b>	<b>04</b>	<b>3</b>			Location of Well (in Quarter)
Zone	Easting	Northing	Source	Accuracy				<b>0.00</b> ft from N/S Boundary
								<b>0.00</b> ft from E/W Boundary

**Well Information**

 Driller # **HAYTER DRILLING LTD**

 Water Use **Research**

Hole #

 Well Use **Water Test Hole**

 Installation Method **Drilled**

 Depth **290.00**

 Water Level **0.00**

 Bit **4.50**

 Flowing Head **0.00**
**Well Casings**

Length (ft)	Btm (ft)	Dia (in)	Description
<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	
<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	
<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	

**Screens**

Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description
<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	
<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	
<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	

**Pump Test**

 Draw Down **0.00** ft

 Duration **0.00** hrs Elevation **1,726.00** ft Aquifer

 Pumping Rate **0.00** igpm Rec. Pumping Rate **0.00** E-Log **SCANNED**

 Temp **0.00** deg. F Intake **0.00** Phys **E03**
**Lithology List**

Depth (ft)	Material	Colour	Description
22.00	Silt	Yellow	Sandy
32.00	Till	Green	Sandy
47.00	Till	Grey	Calcareous
98.00	Till	Grey	Hard
125.00	Sand	Unknown	Medium
145.00	Sand	Unknown	Fine-medium
168.00	Till	Unknown	Oxidized
222.00	Till	Unknown	Coarse
290.00	Clay	Grey	Silty

<b>CANADA CEMENT</b>		Completion	<b>04/29/1964</b>
		RM	
		Major Basin	<b>06</b>
		SubBasin	<b>30</b>
		NTS Map	<b>73B00</b>
WWDR#	<b>052944</b>		

<b>Well Location</b>							
LSD	Quarter	Section	Township	Range	Meridian	Reserve	Riverlot
<b>00</b>	<b>NE</b>	<b>35</b>	<b>035</b>	<b>04</b>	<b>3</b>		
							Location of Well (in Quarter)
							<b>0.00</b> ft from N/S Boundary
Zone	Easting	Northing	Source	Accuracy			
							<b>0.00</b> ft from E/W Boundary

<b>Well Information</b>							
Driller #	<b>INTERNATIONAL WATER SUPPLY LTD</b>						
Water Use	<b>Domestic</b>						
Hole #							
Well Use	<b>Withdrawal</b>	Well Casings					
Installation Method	<b>Drilled</b>	Length (ft)	Btm (ft)	Dia (in)	Description		
Depth	<b>123.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>Steel</b>		
Water Level	<b>18.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>			
Bit	<b>5.00</b>	Screens					
Flowing Head	<b>0.00</b>	Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description	
		<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	
		<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	
		<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	
<b>Pump Test</b>							
Draw Down	<b>0.00</b> ft	Elevation		<b>1,700.00</b> ft	Aquifer		
Duration	<b>0.00</b> hrs	Rec. Pumping Rate		<b>0.00</b>	E-Log <b>No</b>		
Pumping Rate	<b>80.00</b> igpm	Intake		<b>0.00</b>	Phys <b>E03</b>		
Temp	<b>0.00</b> deg. F						

<b>Lithology List</b>			
Depth (ft)	Material	Colour	Description
123.00	Unknown	Unknown	Unknown

<b>AGAR, JAMES</b>	Completion <b>04/23/1981</b>
	RM
	Major Basin <b>06</b>
	SubBasin <b>30</b>
	NTS Map <b>73B00</b>
WWDR# <b>066537</b>	

<b>Well Location</b>							
LSD	Quarter	Section	Township	Range	Meridian	Reserve	Riverlot
<b>00</b>	<b>NE</b>	<b>34</b>	<b>035</b>	<b>04</b>	<b>3</b>		
							Location of Well (in Quarter)
Zone	Easting	Northing	Source	Accuracy			<b>200.00</b> ft from N/S Boundary <b>N</b>
							<b>400.00</b> ft from E/W Boundary <b>E</b>

<b>Well Information</b>							
Driller #	<b>ELSTOW WELL DRILLING</b>						
Water Use	<b>Domestic</b>						
Hole #	<b>001</b>	Well Casings					
Well Use	<b>Withdrawal</b>	Length (ft)	Btm (ft)	Dia (in)	Description		
Installation Method	<b>Drilled</b>	<b>100.00</b>	<b>105.00</b>	<b>5.00</b>	<b>Plastic</b>		
Depth	<b>105.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>			
Water Level	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>			
Bit	<b>6.20</b>	Screens					
Flowing Head	<b>0.00</b>	Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description	
		<b>5.00</b>	<b>105.00</b>	<b>5.00</b>	<b>15.00</b>	<b>Stainless Steel</b>	
		<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>		
		<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>		
<b>Pump Test</b>							
Draw Down	<b>15.00</b> ft						
Duration	<b>6.00</b> hrs	Elevation	<b>1,715.00</b> ft	Aquifer			
Pumping Rate	<b>40.00</b> igpm	Rec. Pumping Rate	<b>10.00</b>	E-Log	<b>No</b>		
Temp	<b>42.00</b> deg. F	Intake	<b>80.00</b>	Phys	<b>E03</b>		

<b>Lithology List</b>			
Depth (ft)	Material	Colour	Description
40.00	Clay	Yellow	Unknown
100.00	Clay	Blue	Unknown
105.00	Sand	Unknown	Unknown



# Water Well Driller's Report

<b>SCHMIDT FARMS LTD</b>		Completion	<b>05/06/1982</b>
			RM
		Major Basin	<b>06</b>
		SubBasin	<b>30</b>
		NTS Map	<b>73B00</b>
WWDR#	<b>071256</b>		

**Well Location**

LSD	Quarter	Section	Township	Range	Meridian	Reserve	Riverlot	
00	NE	35	035	04	3			Location of Well (in Quarter)
								0.00 ft from N/S Boundary
Zone	Easting	Northing	Source	Accuracy				
					0.00 ft from E/W Boundary			

**Well Information**

Driller #	<b>TWEIDT WELLBORING SERVICING LTD</b>						
Water Use	<b>Domestic</b>						
Hole #							
Well Use	<b>Water Test Hole</b>			Well Casings			
Installation Method	<b>Augered</b>			Length (ft)	Btm (ft)	Dia (in)	Description
Depth	<b>40.00</b>			<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	
Water Level	<b>0.00</b>			<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	
Bit	<b>6.00</b>						
Flowing Head	<b>0.00</b>			Screens			
				Length (ft)	Btm (ft)	Dia (in)	Slot (in) Description
				<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
				<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
				<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
<b>Pump Test</b>							
Draw Down	<b>0.00</b> ft						
Duration	<b>0.00</b> hrs	Elevation	<b>1,675.00</b> ft			Aquifer	
Pumping Rate	<b>0.00</b> igpm	Rec. Pumping Rate	<b>0.00</b>			E-Log	<b>No</b>
Temp	<b>0.00</b> deg. F	Intake	<b>0.00</b>			Phys	<b>E03</b>

**Lithology List**

Depth (ft)	Material	Colour	Description
1.00	Topsoil	Unknown	Unknown
20.00	Clay	Yellow	Dry
40.00	Clay	Blue	Dry

<b>WESTCAM</b>	Completion	<b>10/06/1988</b>
		RM
	Major Basin	<b>06</b>
	SubBasin	<b>30</b>
	NTS Map	<b>73B00</b>
WWDR#	<b>090913</b>	

<b>Well Location</b>							
LSD	Quarter	Section	Township	Range	Meridian	Reserve	Riverlot
<b>00</b>	<b>SW</b>	<b>02</b>	<b>036</b>	<b>04</b>	<b>3</b>		
							Location of Well (in Quarter)
							<b>400.00</b> ft from N/S Boundary
Zone	Easting	Northing	Source	Accuracy			
							<b>500.00</b> ft from E/W Boundary <b>W</b>

<b>Well Information</b>						
Driller #	<b>SAM BIEBER'S WATER WELL DRILLING</b>					
Water Use	<b>Domestic</b>					
Hole #	<b>1</b>	Well Casings				
Well Use	<b>Withdrawal</b>	Length (ft)	Btm (ft)	Dia (in)	Description	
Installation Method	<b>Drilled</b>	<b>209.00</b>	<b>208.00</b>	<b>5.00</b>	<b>Plastic</b>	
Depth	<b>222.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>		
Water Level	<b>19.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>		
Bit	<b>7.90</b>	Screens				
Flowing Head	<b>0.00</b>	Length (ft)	Btm (ft)	Dia (in)	Slot (in)	Description
		<b>10.00</b>	<b>218.00</b>	<b>4.00</b>	<b>25.00</b>	<b>Stainless Steel</b>
		<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	
		<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	
<b>Pump Test</b>						
Draw Down	<b>9.00</b> ft	Elevation	<b>1,700.00</b> ft	Aquifer		
Duration	<b>24.00</b> hrs	Rec. Pumping Rate	<b>25.00</b>	E-Log	<b>Yes</b>	
Pumping Rate	<b>40.00</b> igpm	Intake	<b>150.00</b>	Phys	<b>E03</b>	
Temp	<b>40.00</b> deg. F					

<b>Lithology List</b>			
Depth (ft)	Material	Colour	Description
1.00	Clay	Black	Unknown
18.00	Clay	Yellow	Unknown
90.00	Till	Grey	Unknown
98.00	Gravel	Grey	Coarse
167.00	Till	Grey	Unknown
176.00	Sandy Clay	Grey	Unknown
184.00	Clay	Grey	Unknown
190.00	Clay	Grey	Stoney
206.00	Clay	Grey	Unknown
218.00	Gravel	Grey	Unknown
222.00	Clay	Grey	Stoney



<b>MIDAS OILS</b>	Completion	<b>07/05/1952</b>
	RM	<b>344</b>
	Major Basin	<b>06</b>
	SubBasin	<b>30</b>
	NTS Map	<b>73B01</b>
WWDR#	<b>220552</b>	

<b>Well Location</b>							
LSD	Quarter	Section	Township	Range	Meridian	Reserve	Riverlot
<b>00</b>	<b>SW</b>	<b>02</b>	<b>036</b>	<b>04</b>	<b>3</b>		
Zone	Easting	Northing	Source	Accuracy	Location of Well (in Quarter)		
					<b>0.00</b> ft from N/S Boundary		
					<b>0.00</b> ft from E/W Boundary		

<b>Well Information</b>						
Driller #	<b>UNKNOWN</b>					
Water Use						
Hole #						
Well Use						
Installation Method			Well Casings			
Depth	<b>2,882.00</b>		Length (ft)	Btm (ft)	Dia (in)	Description
Water Level	<b>0.00</b>		<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	
Bit	<b>0.00</b>		<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	
Flowing Head	<b>0.00</b>		<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	
			Screens			
			Length (ft)	Btm (ft)	Dia (in)	Slot (in) Description
			<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
			<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
			<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
<b>Pump Test</b>						
Draw Down	<b>0.00</b> ft					
Duration	<b>0.00</b> hrs	Elevation	<b>1,712.00</b> ft	Aquifer		
Pumping Rate	<b>0.00</b> igpm	Rec. Pumping Rate	<b>0.00</b>	E-Log		
Temp	<b>0.00</b> deg. F	Intake	<b>0.00</b>	Phys		

<b>Lithology List</b>			
Depth (ft)	Material	Colour	Description



**PINTER**  
& ASSOCIATES LTD

## **Appendix E**

### **Laboratory Analytical Results**



PINTER AND ASSOCIATES LTD.  
ATTN: Ryan Reiss / Wesley Wizniuk  
710A 48th Street East  
Saskatoon SK S7K 5B4

Date Received: 11-SEP-14  
Report Date: 17-SEP-14 14:25 (MT)  
Version: FINAL

Client Phone: 306-244-1710

## Certificate of Analysis

Lab Work Order #: L1516163  
Project P.O. #: NOT SUBMITTED  
Job Reference: 1607-2  
C of C Numbers:  
Legal Site Desc:

Brian Morgan  
Account Manager

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ADDRESS: #819-58th St E., Saskatoon, SK S7K 6X5 Canada | Phone: +1 306 668 8370 | Fax: +1 306 668 8383  
ALS CANADA LTD Part of the ALS Group A Campbell Brothers Limited Company

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1516163-1 1607-2 HAH-1-B Sampled By: CLIENT on 04-SEP-14 Matrix: SOIL							
<b>Miscellaneous Parameters</b>							
% Moisture	4.2		1.0	%	11-SEP-14	12-SEP-14	R2945335
Phenols (4AAP)	<0.10		0.10	mg/kg	14-SEP-14	15-SEP-14	R2947094
<b>BTEXS in Soil</b>							
Benzene	<0.0050		0.0050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Toluene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Ethylbenzene	<0.010		0.010	mg/kg	11-SEP-14	16-SEP-14	R2949453
Xylenes	<0.10		0.10	mg/kg	11-SEP-14	16-SEP-14	R2949453
o-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
m+p-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Styrene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Surrogate: 1,4-Difluorobenzene	90.8		50-150	%	11-SEP-14	16-SEP-14	R2949453
Surrogate: 4-Bromofluorobenzene	97.9		50-150	%	11-SEP-14	16-SEP-14	R2949453
L1516163-2 1607-2 HAH-2-B Sampled By: CLIENT on 04-SEP-14 Matrix: SOIL							
<b>Miscellaneous Parameters</b>							
% Moisture	18.9		1.0	%	11-SEP-14	12-SEP-14	R2945335
Phenols (4AAP)	<0.10		0.10	mg/kg	15-SEP-14	15-SEP-14	R2947094
<b>BTEXS in Soil</b>							
Benzene	<0.0050		0.0050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Toluene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Ethylbenzene	<0.010		0.010	mg/kg	11-SEP-14	16-SEP-14	R2949453
Xylenes	<0.10		0.10	mg/kg	11-SEP-14	16-SEP-14	R2949453
o-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
m+p-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Styrene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Surrogate: 1,4-Difluorobenzene	76.7		50-150	%	11-SEP-14	16-SEP-14	R2949453
Surrogate: 4-Bromofluorobenzene	74.7		50-150	%	11-SEP-14	16-SEP-14	R2949453
L1516163-3 1607-2 HAH-3-B Sampled By: CLIENT on 04-SEP-14 Matrix: SOIL							
<b>Miscellaneous Parameters</b>							
% Moisture	23.5		1.0	%	11-SEP-14	12-SEP-14	R2945335
Phenols (4AAP)	<0.10		0.10	mg/kg	15-SEP-14	15-SEP-14	R2947094
<b>BTEXS in Soil</b>							
Benzene	<0.0050		0.0050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Toluene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Ethylbenzene	<0.010		0.010	mg/kg	11-SEP-14	16-SEP-14	R2949453
Xylenes	<0.10		0.10	mg/kg	11-SEP-14	16-SEP-14	R2949453
o-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
m+p-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Styrene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Surrogate: 1,4-Difluorobenzene	80.1		50-150	%	11-SEP-14	16-SEP-14	R2949453
Surrogate: 4-Bromofluorobenzene	93.9		50-150	%	11-SEP-14	16-SEP-14	R2949453
L1516163-4 1607-2 HAH-4-B Sampled By: CLIENT on 04-SEP-14 Matrix: SOIL							
<b>Miscellaneous Parameters</b>							
% Moisture	16.2		1.0	%	11-SEP-14	12-SEP-14	R2945335
Phenols (4AAP)	<0.10		0.10	mg/kg	15-SEP-14	15-SEP-14	R2947094

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1516163-4 1607-2 HAH-4-B Sampled By: CLIENT on 04-SEP-14 Matrix: SOIL <b>BTEXS in Soil</b>							
Benzene	<0.0050		0.0050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Toluene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Ethylbenzene	<0.010		0.010	mg/kg	11-SEP-14	16-SEP-14	R2949453
Xylenes	<0.10		0.10	mg/kg	11-SEP-14	16-SEP-14	R2949453
o-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
m+p-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Styrene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Surrogate: 1,4-Difluorobenzene	76.4		50-150	%	11-SEP-14	16-SEP-14	R2949453
Surrogate: 4-Bromofluorobenzene	94.3		50-150	%	11-SEP-14	16-SEP-14	R2949453
L1516163-5 1607-2 HAH-5-B Sampled By: CLIENT on 04-SEP-14 Matrix: SOIL <b>Miscellaneous Parameters</b>							
% Moisture	20.6		1.0	%	11-SEP-14	12-SEP-14	R2945335
Phenols (4AAP)	<0.10		0.10	mg/kg	15-SEP-14	15-SEP-14	R2947094
<b>BTEXS In Soil</b>							
Benzene	<0.0050		0.0050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Toluene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Ethylbenzene	<0.010		0.010	mg/kg	11-SEP-14	16-SEP-14	R2949453
Xylenes	<0.10		0.10	mg/kg	11-SEP-14	16-SEP-14	R2949453
o-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
m+p-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Styrene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Surrogate: 1,4-Difluorobenzene	80.5		50-150	%	11-SEP-14	16-SEP-14	R2949453
Surrogate: 4-Bromofluorobenzene	92.4		50-150	%	11-SEP-14	16-SEP-14	R2949453
L1516163-6 1607-2 HAH-6-B Sampled By: CLIENT on 04-SEP-14 Matrix: SOIL <b>Miscellaneous Parameters</b>							
% Moisture	17.4		1.0	%	11-SEP-14	12-SEP-14	R2945335
Phenols (4AAP)	<0.10		0.10	mg/kg	15-SEP-14	15-SEP-14	R2947094
<b>BTEXS In Soil</b>							
Benzene	<0.0050		0.0050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Toluene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Ethylbenzene	<0.010		0.010	mg/kg	11-SEP-14	16-SEP-14	R2949453
Xylenes	<0.10		0.10	mg/kg	11-SEP-14	16-SEP-14	R2949453
o-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
m+p-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Styrene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Surrogate: 1,4-Difluorobenzene	77.5		50-150	%	11-SEP-14	16-SEP-14	R2949453
Surrogate: 4-Bromofluorobenzene	82.9		50-150	%	11-SEP-14	16-SEP-14	R2949453
L1516163-7 1607-2 HAH-7-B Sampled By: CLIENT on 04-SEP-14 Matrix: SOIL <b>Miscellaneous Parameters</b>							
% Moisture	4.4		1.0	%	11-SEP-14	12-SEP-14	R2945335
Phenols (4AAP)	<0.10		0.10	mg/kg	15-SEP-14	15-SEP-14	R2947094
<b>BTEXS in Soil</b>							
Benzene	<0.0050		0.0050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Toluene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1516163-7 1607-2 HAH-7-B Sampled By: CLIENT on 04-SEP-14 Matrix: SOIL <b>BTEXS in Soil</b>							
Ethylbenzene	<0.010		0.010	mg/kg	11-SEP-14	16-SEP-14	R2949453
Xylenes	<0.10		0.10	mg/kg	11-SEP-14	16-SEP-14	R2949453
o-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
m+p-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Styrene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Surrogate: 1,4-Difluorobenzene	81.4		50-150	%	11-SEP-14	16-SEP-14	R2949453
Surrogate: 4-Bromofluorobenzene	94.1		50-150	%	11-SEP-14	16-SEP-14	R2949453
L1516163-8 1607-2 HAH-8-B Sampled By: CLIENT on 04-SEP-14 Matrix: SOIL <b>Miscellaneous Parameters</b>							
% Moisture	6.0		1.0	%	11-SEP-14	12-SEP-14	R2945335
Phenols (4AAP)	<0.10		0.10	mg/kg	15-SEP-14	15-SEP-14	R2947094
<b>BTEXS in Soil</b>							
Benzene	<0.0050		0.0050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Toluene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Ethylbenzene	<0.010		0.010	mg/kg	11-SEP-14	16-SEP-14	R2949453
Xylenes	<0.10		0.10	mg/kg	11-SEP-14	16-SEP-14	R2949453
o-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
m+p-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Styrene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Surrogate: 1,4-Difluorobenzene	81.5		50-150	%	11-SEP-14	16-SEP-14	R2949453
Surrogate: 4-Bromofluorobenzene	91.0		50-150	%	11-SEP-14	16-SEP-14	R2949453
L1516163-9 1607-2 HAH-9-B Sampled By: CLIENT on 04-SEP-14 Matrix: SOIL <b>Miscellaneous Parameters</b>							
% Moisture	18.0		1.0	%	11-SEP-14	12-SEP-14	R2945335
Phenols (4AAP)	<0.10		0.10	mg/kg	15-SEP-14	15-SEP-14	R2947094
<b>BTEXS in Soil</b>							
Benzene	<0.0050		0.0050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Toluene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Ethylbenzene	<0.010		0.010	mg/kg	11-SEP-14	16-SEP-14	R2949453
Xylenes	<0.10		0.10	mg/kg	11-SEP-14	16-SEP-14	R2949453
o-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
m+p-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Styrene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Surrogate: 1,4-Difluorobenzene	84.4		50-150	%	11-SEP-14	16-SEP-14	R2949453
Surrogate: 4-Bromofluorobenzene	87.0		50-150	%	11-SEP-14	16-SEP-14	R2949453
L1516163-10 1607-2 HAH-10-B Sampled By: CLIENT on 04-SEP-14 Matrix: SOIL <b>Miscellaneous Parameters</b>							
% Moisture	6.1		1.0	%	11-SEP-14	12-SEP-14	R2945335
Phenols (4AAP)	<0.10		0.10	mg/kg	15-SEP-14	15-SEP-14	R2947094
<b>BTEXS in Soil</b>							
Benzene	<0.0050		0.0050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Toluene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Ethylbenzene	<0.010		0.010	mg/kg	11-SEP-14	16-SEP-14	R2949453
Xylenes	<0.10		0.10	mg/kg	11-SEP-14	16-SEP-14	R2949453

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1516163-10 1607-2 HAH-10-B Sampled By: CLIENT on 04-SEP-14 Matrix: SOIL							
<b>BTEXS in Soil</b>							
o-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
m+p-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Styrene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Surrogate: 1,4-Difluorobenzene	96.7		50-150	%	11-SEP-14	16-SEP-14	R2949453
Surrogate: 4-Bromofluorobenzene	92.1		50-150	%	11-SEP-14	16-SEP-14	R2949453
L1516163-11 1607-2 HAH-11-B Sampled By: CLIENT on 04-SEP-14 Matrix: SOIL							
<b>Miscellaneous Parameters</b>							
% Moisture	4.1		1.0	%	11-SEP-14	12-SEP-14	R2945335
Phenols (4AAP)	<0.10		0.10	mg/kg	15-SEP-14	15-SEP-14	R2947094
<b>BTEXS in Soil</b>							
Benzene	<0.0050		0.0050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Toluene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Ethylbenzene	<0.010		0.010	mg/kg	11-SEP-14	16-SEP-14	R2949453
Xylenes	<0.10		0.10	mg/kg	11-SEP-14	16-SEP-14	R2949453
o-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
m+p-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Styrene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Surrogate: 1,4-Difluorobenzene	92.0		50-150	%	11-SEP-14	16-SEP-14	R2949453
Surrogate: 4-Bromofluorobenzene	94.5		50-150	%	11-SEP-14	16-SEP-14	R2949453
L1516163-12 1607-2 HAH-12-B Sampled By: CLIENT on 04-SEP-14 Matrix: SOIL							
<b>Miscellaneous Parameters</b>							
% Moisture	13.3		1.0	%	11-SEP-14	12-SEP-14	R2945335
Phenols (4AAP)	<0.10		0.10	mg/kg	15-SEP-14	15-SEP-14	R2947094
<b>BTEXS in Soil</b>							
Benzene	<0.0050		0.0050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Toluene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Ethylbenzene	<0.010		0.010	mg/kg	11-SEP-14	16-SEP-14	R2949453
Xylenes	<0.10		0.10	mg/kg	11-SEP-14	16-SEP-14	R2949453
o-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
m+p-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Styrene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Surrogate: 1,4-Difluorobenzene	94.8		50-150	%	11-SEP-14	16-SEP-14	R2949453
Surrogate: 4-Bromofluorobenzene	84.2		50-150	%	11-SEP-14	16-SEP-14	R2949453
L1516163-13 1607-2 DUPE-9 Sampled By: CLIENT on 05-SEP-14 Matrix: SOIL							
<b>Miscellaneous Parameters</b>							
% Moisture	17.3		1.0	%	11-SEP-14	12-SEP-14	R2945335
Phenols (4AAP)	<0.10		0.10	mg/kg	15-SEP-14	15-SEP-14	R2947094
<b>BTEXS In Soil</b>							
Benzene	<0.0050		0.0050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Toluene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Ethylbenzene	<0.010		0.010	mg/kg	11-SEP-14	16-SEP-14	R2949453
Xylenes	<0.10		0.10	mg/kg	11-SEP-14	16-SEP-14	R2949453
o-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
m+p-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1516163-13 1607-2 DUPE-9 Sampled By: CLIENT on 05-SEP-14 Matrix: SOIL <b>BTEXS in Soil</b>							
Styrene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Surrogate: 1,4-Difluorobenzene	79.8		50-150	%	11-SEP-14	16-SEP-14	R2949453
Surrogate: 4-Bromofluorobenzene	82.2		50-150	%	11-SEP-14	16-SEP-14	R2949453
L1516163-14 1607-2 HAH-13-B Sampled By: CLIENT on 05-SEP-14 Matrix: SOIL <b>Miscellaneous Parameters</b>							
% Moisture	8.0		1.0	%	11-SEP-14	12-SEP-14	R2945335
Phenols (4AAP)	<0.10		0.10	mg/kg	15-SEP-14	15-SEP-14	R2947094
<b>BTEXS in Soil</b>							
Benzene	<0.0050		0.0050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Toluene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Ethylbenzene	<0.010		0.010	mg/kg	11-SEP-14	16-SEP-14	R2949453
Xylenes	<0.10		0.10	mg/kg	11-SEP-14	16-SEP-14	R2949453
o-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
m+p-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Styrene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Surrogate: 1,4-Difluorobenzene	103.8		50-150	%	11-SEP-14	16-SEP-14	R2949453
Surrogate: 4-Bromofluorobenzene	92.8		50-150	%	11-SEP-14	16-SEP-14	R2949453
L1516163-15 1607-2 HAH-14-B Sampled By: CLIENT on 05-SEP-14 Matrix: SOIL <b>Miscellaneous Parameters</b>							
% Moisture	19.1		1.0	%	11-SEP-14	12-SEP-14	R2945335
Phenols (4AAP)	<0.10		0.10	mg/kg	15-SEP-14	15-SEP-14	R2947094
<b>BTEXS in Soil</b>							
Benzene	<0.0050		0.0050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Toluene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Ethylbenzene	<0.010		0.010	mg/kg	11-SEP-14	16-SEP-14	R2949453
Xylenes	<0.10		0.10	mg/kg	11-SEP-14	16-SEP-14	R2949453
o-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
m+p-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Styrene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Surrogate: 1,4-Difluorobenzene	84.0		50-150	%	11-SEP-14	16-SEP-14	R2949453
Surrogate: 4-Bromofluorobenzene	80.5		50-150	%	11-SEP-14	16-SEP-14	R2949453
L1516163-16 1607-2 HAH-15-B Sampled By: CLIENT on 05-SEP-14 Matrix: SOIL <b>Miscellaneous Parameters</b>							
% Moisture	5.0		1.0	%	11-SEP-14	12-SEP-14	R2945335
Phenols (4AAP)	<0.10		0.10	mg/kg	15-SEP-14	15-SEP-14	R2947094
<b>BTEXS in Soil</b>							
Benzene	<0.0050		0.0050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Toluene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Ethylbenzene	<0.010		0.010	mg/kg	11-SEP-14	16-SEP-14	R2949453
Xylenes	<0.10		0.10	mg/kg	11-SEP-14	16-SEP-14	R2949453
o-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
m+p-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Styrene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Surrogate: 1,4-Difluorobenzene	103.1		50-150	%	11-SEP-14	16-SEP-14	R2949453

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1516163-16 1607-2 HAH-15-B Sampled By: CLIENT on 05-SEP-14 Matrix: SOIL <b>BTEXS in Soil</b> Surrogate: 4-Bromofluorobenzene	83.1		50-150	%	11-SEP-14	16-SEP-14	R2949453
L1516163-17 1607-2 HAH-16-B Sampled By: CLIENT on 05-SEP-14 Matrix: SOIL <b>Miscellaneous Parameters</b> % Moisture	24.4		1.0	%	11-SEP-14	12-SEP-14	R2945335
Phenols (4AAP)	<0.10		0.10	mg/kg	15-SEP-14	15-SEP-14	R2947094
<b>BTEXS in Soil</b> Benzene	<0.0050		0.0050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Toluene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Ethylbenzene	<0.010		0.010	mg/kg	11-SEP-14	16-SEP-14	R2949453
Xylenes	<0.10		0.10	mg/kg	11-SEP-14	16-SEP-14	R2949453
o-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
m+p-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Styrene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Surrogate: 1,4-Difluorobenzene	84.1		50-150	%	11-SEP-14	16-SEP-14	R2949453
Surrogate: 4-Bromofluorobenzene	83.5		50-150	%	11-SEP-14	16-SEP-14	R2949453
L1516163-18 1607-2 HAH-17-B Sampled By: CLIENT on 05-SEP-14 Matrix: SOIL <b>Miscellaneous Parameters</b> % Moisture	4.0		1.0	%	11-SEP-14	12-SEP-14	R2945335
Phenols (4AAP)	<0.10		0.10	mg/kg	15-SEP-14	15-SEP-14	R2947094
<b>BTEXS in Soil</b> Benzene	<0.0050		0.0050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Toluene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Ethylbenzene	<0.010		0.010	mg/kg	11-SEP-14	16-SEP-14	R2949453
Xylenes	<0.10		0.10	mg/kg	11-SEP-14	16-SEP-14	R2949453
o-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
m+p-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Styrene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Surrogate: 1,4-Difluorobenzene	84.0		50-150	%	11-SEP-14	16-SEP-14	R2949453
Surrogate: 4-Bromofluorobenzene	80.9		50-150	%	11-SEP-14	16-SEP-14	R2949453
L1516163-19 1607-2 HAH-18-B Sampled By: CLIENT on 05-SEP-14 Matrix: SOIL <b>Miscellaneous Parameters</b> % Moisture	19.6		1.0	%	11-SEP-14	12-SEP-14	R2945335
Phenols (4AAP)	<0.10		0.10	mg/kg	15-SEP-14	15-SEP-14	R2947094
<b>BTEXS in Soil</b> Benzene	<0.0050		0.0050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Toluene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Ethylbenzene	<0.010		0.010	mg/kg	11-SEP-14	16-SEP-14	R2949453
Xylenes	<0.10		0.10	mg/kg	11-SEP-14	16-SEP-14	R2949453
o-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
m+p-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Styrene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Surrogate: 1,4-Difluorobenzene	87.0		50-150	%	11-SEP-14	16-SEP-14	R2949453
Surrogate: 4-Bromofluorobenzene	87.3		50-150	%	11-SEP-14	16-SEP-14	R2949453

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1516163-20 1607-2 HAH-19-B Sampled By: CLIENT on 05-SEP-14 Matrix: SOIL <b>Miscellaneous Parameters</b>							
% Moisture	17.6		1.0	%	11-SEP-14	12-SEP-14	R2945335
Phenols (4AAP)	<0.10		0.10	mg/kg	15-SEP-14	16-SEP-14	R2949785
<b>BTEXS in Soil</b>							
Benzene	<0.0050		0.0050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Toluene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Ethylbenzene	<0.010		0.010	mg/kg	11-SEP-14	16-SEP-14	R2949453
Xylenes	<0.10		0.10	mg/kg	11-SEP-14	16-SEP-14	R2949453
o-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
m+p-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Styrene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949453
Surrogate: 1,4-Difluorobenzene	86.2		50-150	%	11-SEP-14	16-SEP-14	R2949453
Surrogate: 4-Bromofluorobenzene	80.9		50-150	%	11-SEP-14	16-SEP-14	R2949453
L1516163-21 1607-2 DUPE-14-B Sampled By: CLIENT on 05-SEP-14 Matrix: SOIL <b>Miscellaneous Parameters</b>							
% Moisture	16.5		1.0	%	11-SEP-14	12-SEP-14	R2945321
Phenols (4AAP)	<0.10		0.10	mg/kg	15-SEP-14	16-SEP-14	R2949785
<b>BTEXS in Soil</b>							
Benzene	<0.0050		0.0050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Toluene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Ethylbenzene	<0.010		0.010	mg/kg	11-SEP-14	16-SEP-14	R2949457
Xylenes	<0.10		0.10	mg/kg	11-SEP-14	16-SEP-14	R2949457
o-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
m+p-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Styrene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Surrogate: 1,4-Difluorobenzene	94.7		50-150	%	11-SEP-14	16-SEP-14	R2949457
Surrogate: 4-Bromofluorobenzene	83.4		50-150	%	11-SEP-14	16-SEP-14	R2949457
L1516163-22 1607-2 HAH-20-B Sampled By: CLIENT on 05-SEP-14 Matrix: SOIL <b>Miscellaneous Parameters</b>							
% Moisture	19.0		1.0	%	11-SEP-14	12-SEP-14	R2945321
Phenols (4AAP)	<0.10		0.10	mg/kg	15-SEP-14	16-SEP-14	R2949785
<b>BTEXS in Soil</b>							
Benzene	<0.0050		0.0050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Toluene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Ethylbenzene	<0.010		0.010	mg/kg	11-SEP-14	16-SEP-14	R2949457
Xylenes	<0.10		0.10	mg/kg	11-SEP-14	16-SEP-14	R2949457
o-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
m+p-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Styrene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Surrogate: 1,4-Difluorobenzene	95.7		50-150	%	11-SEP-14	16-SEP-14	R2949457
Surrogate: 4-Bromofluorobenzene	92.9		50-150	%	11-SEP-14	16-SEP-14	R2949457
L1516163-23 1607-2 HAH-21-B Sampled By: CLIENT on 05-SEP-14 Matrix: SOIL <b>Miscellaneous Parameters</b>							
% Moisture	16.4		1.0	%	11-SEP-14	12-SEP-14	R2945321
Phenols (4AAP)	<0.10		0.10	mg/kg	15-SEP-14	16-SEP-14	R2949785

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1516163-23 1607-2 HAH-21-B							
Sampled By: CLIENT on 05-SEP-14							
Matrix: SOIL							
<b>BTEXS in Soil</b>							
Benzene	<0.0050		0.0050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Toluene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Ethylbenzene	<0.010		0.010	mg/kg	11-SEP-14	16-SEP-14	R2949457
Xylenes	<0.10		0.10	mg/kg	11-SEP-14	16-SEP-14	R2949457
o-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
m+p-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Styrene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Surrogate: 1,4-Difluorobenzene	90.4		50-150	%	11-SEP-14	16-SEP-14	R2949457
Surrogate: 4-Bromofluorobenzene	101.5		50-150	%	11-SEP-14	16-SEP-14	R2949457
L1516163-24 1607-2 HAH-22-B							
Sampled By: CLIENT on 05-SEP-14							
Matrix: SOIL							
<b>Miscellaneous Parameters</b>							
% Moisture	13.6		1.0	%	11-SEP-14	12-SEP-14	R2945321
Phenols (4AAP)	<0.10		0.10	mg/kg	15-SEP-14	16-SEP-14	R2949785
<b>BTEXS in Soil</b>							
Benzene	<0.0050		0.0050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Toluene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Ethylbenzene	<0.010		0.010	mg/kg	11-SEP-14	16-SEP-14	R2949457
Xylenes	<0.10		0.10	mg/kg	11-SEP-14	16-SEP-14	R2949457
o-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
m+p-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Styrene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Surrogate: 1,4-Difluorobenzene	86.1		50-150	%	11-SEP-14	16-SEP-14	R2949457
Surrogate: 4-Bromofluorobenzene	108.3		50-150	%	11-SEP-14	16-SEP-14	R2949457
L1516163-25 1607-2 HAH-23-B							
Sampled By: CLIENT on 05-SEP-14							
Matrix: SOIL							
<b>Miscellaneous Parameters</b>							
% Moisture	15.7		1.0	%	11-SEP-14	12-SEP-14	R2945321
Phenols (4AAP)	<0.10		0.10	mg/kg	15-SEP-14	16-SEP-14	R2949785
<b>BTEXS in Soil</b>							
Benzene	<0.0050		0.0050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Toluene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Ethylbenzene	<0.010		0.010	mg/kg	11-SEP-14	16-SEP-14	R2949457
Xylenes	<0.10		0.10	mg/kg	11-SEP-14	16-SEP-14	R2949457
o-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
m+p-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Styrene	0.353		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Surrogate: 1,4-Difluorobenzene	95.3		50-150	%	11-SEP-14	16-SEP-14	R2949457
Surrogate: 4-Bromofluorobenzene	97.9		50-150	%	11-SEP-14	16-SEP-14	R2949457
L1516163-26 1607-2 HAH-24-B							
Sampled By: CLIENT on 05-SEP-14							
Matrix: SOIL							
<b>Miscellaneous Parameters</b>							
% Moisture	20.9		1.0	%	11-SEP-14	12-SEP-14	R2945321
Phenols (4AAP)	<0.10		0.10	mg/kg	15-SEP-14	16-SEP-14	R2949785
<b>BTEXS in Soil</b>							
Benzene	<0.0050		0.0050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Toluene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1516163-26 1607-2 HAH-24-B Sampled By: CLIENT on 05-SEP-14 Matrix: SOIL							
<b>BTEXS in Soil</b>							
Ethylbenzene	<0.010		0.010	mg/kg	11-SEP-14	16-SEP-14	R2949457
Xylenes	<0.10		0.10	mg/kg	11-SEP-14	16-SEP-14	R2949457
o-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
m+p-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Styrene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Surrogate: 1,4-Difluorobenzene	87.2		50-150	%	11-SEP-14	16-SEP-14	R2949457
Surrogate: 4-Bromofluorobenzene	100.6		50-150	%	11-SEP-14	16-SEP-14	R2949457
L1516163-27 1607-2 HAH-25-B Sampled By: CLIENT on 05-SEP-14 Matrix: SOIL							
<b>Miscellaneous Parameters</b>							
% Moisture	20.2		1.0	%	11-SEP-14	12-SEP-14	R2945321
Phenols (4AAP)	<0.10		0.10	mg/kg	15-SEP-14	16-SEP-14	R2949785
<b>BTEXS in Soil</b>							
Benzene	<0.0050		0.0050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Toluene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Ethylbenzene	<0.010		0.010	mg/kg	11-SEP-14	16-SEP-14	R2949457
Xylenes	<0.10		0.10	mg/kg	11-SEP-14	16-SEP-14	R2949457
o-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
m+p-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Styrene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Surrogate: 1,4-Difluorobenzene	74.4		50-150	%	11-SEP-14	16-SEP-14	R2949457
Surrogate: 4-Bromofluorobenzene	82.7		50-150	%	11-SEP-14	16-SEP-14	R2949457
L1516163-28 1607-2 HAH-26-B Sampled By: CLIENT on 05-SEP-14 Matrix: SOIL							
<b>Miscellaneous Parameters</b>							
% Moisture	18.5		1.0	%	11-SEP-14	12-SEP-14	R2945321
Phenols (4AAP)	<0.10		0.10	mg/kg	15-SEP-14	16-SEP-14	R2949785
<b>BTEXS in Soil</b>							
Benzene	<0.0050		0.0050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Toluene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Ethylbenzene	<0.010		0.010	mg/kg	11-SEP-14	16-SEP-14	R2949457
Xylenes	<0.10		0.10	mg/kg	11-SEP-14	16-SEP-14	R2949457
o-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
m+p-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Styrene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Surrogate: 1,4-Difluorobenzene	101.2		50-150	%	11-SEP-14	16-SEP-14	R2949457
Surrogate: 4-Bromofluorobenzene	87.8		50-150	%	11-SEP-14	16-SEP-14	R2949457
L1516163-29 1607-2 HAH-27-B Sampled By: CLIENT on 05-SEP-14 Matrix: SOIL							
<b>Miscellaneous Parameters</b>							
% Moisture	21.0		1.0	%	11-SEP-14	12-SEP-14	R2945321
Phenols (4AAP)	<0.10		0.10	mg/kg	15-SEP-14	16-SEP-14	R2949785
<b>BTEXS in Soil</b>							
Benzene	<0.0050		0.0050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Toluene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Ethylbenzene	<0.010		0.010	mg/kg	11-SEP-14	16-SEP-14	R2949457
Xylenes	<0.10		0.10	mg/kg	11-SEP-14	16-SEP-14	R2949457

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1516163-29 1607-2 HAH-27-B Sampled By: CLIENT on 05-SEP-14 Matrix: SOIL <b>BTEXS in Soil</b>							
o-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
m+p-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Styrene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Surrogate: 1,4-Difluorobenzene	94.1		50-150	%	11-SEP-14	16-SEP-14	R2949457
Surrogate: 4-Bromofluorobenzene	82.1		50-150	%	11-SEP-14	16-SEP-14	R2949457
L1516163-30 1607-2 HAH-28-B Sampled By: CLIENT on 05-SEP-14 Matrix: SOIL <b>Miscellaneous Parameters</b>							
% Moisture	17.6		1.0	%	11-SEP-14	12-SEP-14	R2945321
Phenols (4AAP)	<0.10		0.10	mg/kg	15-SEP-14	16-SEP-14	R2949785
<b>BTEXS in Soil</b>							
Benzene	<0.0050		0.0050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Toluene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Ethylbenzene	<0.010		0.010	mg/kg	11-SEP-14	16-SEP-14	R2949457
Xylenes	<0.10		0.10	mg/kg	11-SEP-14	16-SEP-14	R2949457
o-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
m+p-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Styrene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Surrogate: 1,4-Difluorobenzene	93.9		50-150	%	11-SEP-14	16-SEP-14	R2949457
Surrogate: 4-Bromofluorobenzene	88.8		50-150	%	11-SEP-14	16-SEP-14	R2949457
L1516163-31 1607-2 HAH-29-B Sampled By: CLIENT on 05-SEP-14 Matrix: SOIL <b>Miscellaneous Parameters</b>							
% Moisture	21.6		1.0	%	11-SEP-14	12-SEP-14	R2945321
Phenols (4AAP)	<0.10		0.10	mg/kg	15-SEP-14	16-SEP-14	R2949785
<b>BTEXS in Soil</b>							
Benzene	<0.0050		0.0050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Toluene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Ethylbenzene	<0.010		0.010	mg/kg	11-SEP-14	16-SEP-14	R2949457
Xylenes	<0.10		0.10	mg/kg	11-SEP-14	16-SEP-14	R2949457
o-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
m+p-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Styrene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Surrogate: 1,4-Difluorobenzene	88.3		50-150	%	11-SEP-14	16-SEP-14	R2949457
Surrogate: 4-Bromofluorobenzene	89.2		50-150	%	11-SEP-14	16-SEP-14	R2949457
L1516163-32 1607-2 DUPE-29-B Sampled By: CLIENT on 05-SEP-14 Matrix: SOIL <b>Miscellaneous Parameters</b>							
% Moisture	20.7		1.0	%	11-SEP-14	12-SEP-14	R2945321
Phenols (4AAP)	<0.10		0.10	mg/kg	15-SEP-14	16-SEP-14	R2949785
<b>BTEXS in Soil</b>							
Benzene	<0.0050		0.0050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Toluene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Ethylbenzene	<0.010		0.010	mg/kg	11-SEP-14	16-SEP-14	R2949457
Xylenes	<0.10		0.10	mg/kg	11-SEP-14	16-SEP-14	R2949457
o-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
m+p-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
<b>L1516163-32 1607-2 DUPE-29-B</b> Sampled By: CLIENT on 05-SEP-14 Matrix: SOIL <b>BTEXS in Soil</b>							
Styrene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Surrogate: 1,4-Difluorobenzene	82.3		50-150	%	11-SEP-14	16-SEP-14	R2949457
Surrogate: 4-Bromofluorobenzene	81.7		50-150	%	11-SEP-14	16-SEP-14	R2949457
<b>L1516163-33 1607-2 HAH-30-B</b> Sampled By: CLIENT on 05-SEP-14 Matrix: SOIL <b>Miscellaneous Parameters</b>							
% Moisture	11.9		1.0	%	11-SEP-14	12-SEP-14	R2945321
Phenols (4AAP)	<0.10		0.10	mg/kg	15-SEP-14	16-SEP-14	R2949785
<b>BTEXS in Soil</b>							
Benzene	<0.0050		0.0050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Toluene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Ethylbenzene	<0.010		0.010	mg/kg	11-SEP-14	16-SEP-14	R2949457
Xylenes	<0.10		0.10	mg/kg	11-SEP-14	16-SEP-14	R2949457
o-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
m+p-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Styrene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Surrogate: 1,4-Difluorobenzene	85.5		50-150	%	11-SEP-14	16-SEP-14	R2949457
Surrogate: 4-Bromofluorobenzene	88.4		50-150	%	11-SEP-14	16-SEP-14	R2949457
<b>L1516163-34 1607-2 HAH-31-B</b> Sampled By: CLIENT on 05-SEP-14 Matrix: SOIL <b>Miscellaneous Parameters</b>							
% Moisture	15.8		1.0	%	11-SEP-14	12-SEP-14	R2945321
Phenols (4AAP)	<0.10		0.10	mg/kg	15-SEP-14	16-SEP-14	R2949785
<b>BTEXS in Soil</b>							
Benzene	<0.0050		0.0050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Toluene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Ethylbenzene	<0.010		0.010	mg/kg	11-SEP-14	16-SEP-14	R2949457
Xylenes	<0.10		0.10	mg/kg	11-SEP-14	16-SEP-14	R2949457
o-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
m+p-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Styrene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Surrogate: 1,4-Difluorobenzene	77.0		50-150	%	11-SEP-14	16-SEP-14	R2949457
Surrogate: 4-Bromofluorobenzene	106.5		50-150	%	11-SEP-14	16-SEP-14	R2949457
<b>L1516163-35 1607-2 HAH-32-B</b> Sampled By: CLIENT on 05-SEP-14 Matrix: SOIL <b>Miscellaneous Parameters</b>							
% Moisture	24.4		1.0	%	11-SEP-14	12-SEP-14	R2945321
Phenols (4AAP)	<0.10		0.10	mg/kg	15-SEP-14	16-SEP-14	R2949785
<b>BTEXS in Soil</b>							
Benzene	<0.0050		0.0050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Toluene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Ethylbenzene	<0.010		0.010	mg/kg	11-SEP-14	16-SEP-14	R2949457
Xylenes	<0.10		0.10	mg/kg	11-SEP-14	16-SEP-14	R2949457
o-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
m+p-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Styrene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Surrogate: 1,4-Difluorobenzene	80.0		50-150	%	11-SEP-14	16-SEP-14	R2949457

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1516163-35 1607-2 HAH-32-B Sampled By: CLIENT on 05-SEP-14 Matrix: SOIL <b>BTEXS in Soil</b> Surrogate: 4-Bromofluorobenzene	83.1		50-150	%	11-SEP-14	16-SEP-14	R2949457
L1516163-36 1607-2 HAH-33-B Sampled By: CLIENT on 05-SEP-14 Matrix: SOIL <b>Miscellaneous Parameters</b> % Moisture Phenols (4AAP) <b>BTEXS in Soil</b> Benzene Toluene Ethylbenzene Xylenes o-Xylene m+p-Xylene Styrene Surrogate: 1,4-Difluorobenzene Surrogate: 4-Bromofluorobenzene	15.0 <0.10  <0.0050 <0.050 <0.010 <0.10 <0.050 <0.050 <0.050 83.3 81.2		1.0 0.10  0.0050 0.050 0.010 0.10 0.050 0.050 50-150 50-150	% mg/kg  mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg %	11-SEP-14 15-SEP-14  11-SEP-14 11-SEP-14 11-SEP-14 11-SEP-14 11-SEP-14 11-SEP-14 11-SEP-14 11-SEP-14	12-SEP-14 16-SEP-14  16-SEP-14 16-SEP-14 16-SEP-14 16-SEP-14 16-SEP-14 16-SEP-14 16-SEP-14 16-SEP-14	R2945321 R2949785  R2949457 R2949457 R2949457 R2949457 R2949457 R2949457 R2949457 R2949457 R2949457
L1516163-37 1607-2 HAH-34-B Sampled By: CLIENT on 05-SEP-14 Matrix: SOIL <b>Miscellaneous Parameters</b> % Moisture Phenols (4AAP) <b>BTEXS in Soil</b> Benzene Toluene Ethylbenzene Xylenes o-Xylene m+p-Xylene Styrene Surrogate: 1,4-Difluorobenzene Surrogate: 4-Bromofluorobenzene	23.0 <0.10  <0.0050 <0.050 <0.010 <0.10 <0.050 <0.050 <0.050 97.9 96.9		1.0 0.10  0.0050 0.050 0.010 0.10 0.050 0.050 50-150 50-150	% mg/kg  mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg %	11-SEP-14 15-SEP-14  11-SEP-14 11-SEP-14 11-SEP-14 11-SEP-14 11-SEP-14 11-SEP-14 11-SEP-14	12-SEP-14 16-SEP-14  16-SEP-14 16-SEP-14 16-SEP-14 16-SEP-14 16-SEP-14 16-SEP-14 16-SEP-14	R2945321 R2949785  R2949457 R2949457 R2949457 R2949457 R2949457 R2949457 R2949457 R2949457
L1516163-38 1607-2 HAH-35-B Sampled By: CLIENT on 05-SEP-14 Matrix: SOIL <b>Miscellaneous Parameters</b> % Moisture Phenols (4AAP) <b>BTEXS in Soil</b> Benzene Toluene Ethylbenzene Xylenes o-Xylene m+p-Xylene Styrene Surrogate: 1,4-Difluorobenzene Surrogate: 4-Bromofluorobenzene	19.4 <0.10  <0.0050 <0.050 <0.010 <0.10 <0.050 <0.050 <0.050 73.9 83.1		1.0 0.10  0.0050 0.050 0.010 0.10 0.050 0.050 50-150 50-150	% mg/kg  mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg %	11-SEP-14 15-SEP-14  11-SEP-14 11-SEP-14 11-SEP-14 11-SEP-14 11-SEP-14 11-SEP-14 11-SEP-14	12-SEP-14 16-SEP-14  16-SEP-14 16-SEP-14 16-SEP-14 16-SEP-14 16-SEP-14 16-SEP-14 16-SEP-14	R2945321 R2949785  R2949457 R2949457 R2949457 R2949457 R2949457 R2949457 R2949457 R2949457

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1516163-39 1607-2 HAH-36-B Sampled By: CLIENT on 05-SEP-14 Matrix: SOIL <b>Miscellaneous Parameters</b>							
% Moisture	20.2		1.0	%	11-SEP-14	12-SEP-14	R2945321
Phenols (4AAP)	<0.10		0.10	mg/kg	15-SEP-14	16-SEP-14	R2949785
<b>BTEXS in Soil</b>							
Benzene	<0.0050		0.0050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Toluene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Ethylbenzene	<0.010		0.010	mg/kg	11-SEP-14	16-SEP-14	R2949457
Xylenes	<0.10		0.10	mg/kg	11-SEP-14	16-SEP-14	R2949457
o-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
m+p-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Styrene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Surrogate: 1,4-Difluorobenzene	80.1		50-150	%	11-SEP-14	16-SEP-14	R2949457
Surrogate: 4-Bromofluorobenzene	95.5		50-150	%	11-SEP-14	16-SEP-14	R2949457
L1516163-40 1607-2 HAH-37-B Sampled By: CLIENT on 05-SEP-14 Matrix: SOIL <b>Miscellaneous Parameters</b>							
% Moisture	12.6		1.0	%	11-SEP-14	12-SEP-14	R2945321
Phenols (4AAP)	<0.10		0.10	mg/kg	15-SEP-14	16-SEP-14	R2949785
<b>BTEXS in Soil</b>							
Benzene	<0.0050		0.0050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Toluene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Ethylbenzene	<0.010		0.010	mg/kg	11-SEP-14	16-SEP-14	R2949457
Xylenes	<0.10		0.10	mg/kg	11-SEP-14	16-SEP-14	R2949457
o-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
m+p-Xylene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Styrene	<0.050		0.050	mg/kg	11-SEP-14	16-SEP-14	R2949457
Surrogate: 1,4-Difluorobenzene	87.1		50-150	%	11-SEP-14	16-SEP-14	R2949457
Surrogate: 4-Bromofluorobenzene	85.4		50-150	%	11-SEP-14	16-SEP-14	R2949457
L1516163-41 1607-2 HAH-38-B Sampled By: CLIENT on 05-SEP-14 Matrix: SOIL <b>Miscellaneous Parameters</b>							
% Moisture	19.0		1.0	%	12-SEP-14	15-SEP-14	R2947251
Phenols (4AAP)	<0.10		0.10	mg/kg	15-SEP-14	16-SEP-14	R2949785
<b>BTEXS in Soil</b>							
Benzene	<0.0050		0.0050	mg/kg	12-SEP-14	15-SEP-14	R2948010
Toluene	<0.050		0.050	mg/kg	12-SEP-14	15-SEP-14	R2948010
Ethylbenzene	<0.010		0.010	mg/kg	12-SEP-14	15-SEP-14	R2948010
Xylenes	<0.10		0.10	mg/kg	12-SEP-14	15-SEP-14	R2948010
o-Xylene	<0.050		0.050	mg/kg	12-SEP-14	15-SEP-14	R2948010
m+p-Xylene	<0.050		0.050	mg/kg	12-SEP-14	15-SEP-14	R2948010
Styrene	<0.050		0.050	mg/kg	12-SEP-14	15-SEP-14	R2948010
Surrogate: 1,4-Difluorobenzene	85.8		50-150	%	12-SEP-14	15-SEP-14	R2948010
Surrogate: 4-Bromofluorobenzene	81.2		50-150	%	12-SEP-14	15-SEP-14	R2948010
L1516163-42 1607-2 HAH-39-B Sampled By: CLIENT on 05-SEP-14 Matrix: SOIL <b>Miscellaneous Parameters</b>							
% Moisture	18.9		1.0	%	12-SEP-14	15-SEP-14	R2947251
Phenols (4AAP)	<0.10		0.10	mg/kg	15-SEP-14	16-SEP-14	R2949785

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1516163-42 1607-2 HAH-39-B Sampled By: CLIENT on 05-SEP-14 Matrix: SOIL							
<b>BTEXS in Soil</b>							
Benzene	<0.0050		0.0050	mg/kg	12-SEP-14	15-SEP-14	R2948010
Toluene	<0.050		0.050	mg/kg	12-SEP-14	15-SEP-14	R2948010
Ethylbenzene	<0.010		0.010	mg/kg	12-SEP-14	15-SEP-14	R2948010
Xylenes	<0.10		0.10	mg/kg	12-SEP-14	15-SEP-14	R2948010
o-Xylene	<0.050		0.050	mg/kg	12-SEP-14	15-SEP-14	R2948010
m+p-Xylene	<0.050		0.050	mg/kg	12-SEP-14	15-SEP-14	R2948010
Styrene	<0.050		0.050	mg/kg	12-SEP-14	15-SEP-14	R2948010
Surrogate: 1,4-Difluorobenzene	85.1		50-150	%	12-SEP-14	15-SEP-14	R2948010
Surrogate: 4-Bromofluorobenzene	93.6		50-150	%	12-SEP-14	15-SEP-14	R2948010
L1516163-43 1607-2 DUPE-39-B Sampled By: CLIENT on 05-SEP-14 Matrix: SOIL							
<b>Miscellaneous Parameters</b>							
% Moisture	10.4		1.0	%	12-SEP-14	15-SEP-14	R2947251
Phenols (4AAP)	<0.10		0.10	mg/kg	15-SEP-14	16-SEP-14	R2949785
<b>BTEXS in Soil</b>							
Benzene	<0.0050		0.0050	mg/kg	12-SEP-14	15-SEP-14	R2948010
Toluene	<0.050		0.050	mg/kg	12-SEP-14	15-SEP-14	R2948010
Ethylbenzene	<0.010		0.010	mg/kg	12-SEP-14	15-SEP-14	R2948010
Xylenes	<0.10		0.10	mg/kg	12-SEP-14	15-SEP-14	R2948010
o-Xylene	<0.050		0.050	mg/kg	12-SEP-14	15-SEP-14	R2948010
m+p-Xylene	<0.050		0.050	mg/kg	12-SEP-14	15-SEP-14	R2948010
Styrene	<0.050		0.050	mg/kg	12-SEP-14	15-SEP-14	R2948010
Surrogate: 1,4-Difluorobenzene	82.3		50-150	%	12-SEP-14	15-SEP-14	R2948010
Surrogate: 4-Bromofluorobenzene	91.7		50-150	%	12-SEP-14	15-SEP-14	R2948010
L1516163-44 1607-2 HAH-40-B Sampled By: CLIENT on 05-SEP-14 Matrix: SOIL							
<b>Miscellaneous Parameters</b>							
% Moisture	18.9		1.0	%	12-SEP-14	15-SEP-14	R2947251
Phenols (4AAP)	<0.10		0.10	mg/kg	15-SEP-14	16-SEP-14	R2949785
<b>BTEXS in Soil</b>							
Benzene	<0.0050		0.0050	mg/kg	12-SEP-14	15-SEP-14	R2948010
Toluene	<0.050		0.050	mg/kg	12-SEP-14	15-SEP-14	R2948010
Ethylbenzene	<0.010		0.010	mg/kg	12-SEP-14	15-SEP-14	R2948010
Xylenes	<0.10		0.10	mg/kg	12-SEP-14	15-SEP-14	R2948010
o-Xylene	<0.050		0.050	mg/kg	12-SEP-14	15-SEP-14	R2948010
m+p-Xylene	<0.050		0.050	mg/kg	12-SEP-14	15-SEP-14	R2948010
Styrene	<0.050		0.050	mg/kg	12-SEP-14	15-SEP-14	R2948010
Surrogate: 1,4-Difluorobenzene	83.0		50-150	%	12-SEP-14	15-SEP-14	R2948010
Surrogate: 4-Bromofluorobenzene	81.7		50-150	%	12-SEP-14	15-SEP-14	R2948010

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## Reference Information

## Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
BTEX+S-HSMS-SK	Soil	BTEXS in Soil	EPA Method 8260C, 5021A
5 grams of soil is extracted into 10 ml of methanol using a wrist action shaker. The methanol extract is then prepared for headspace analysis and quantified by GC-MS in SIM mode. Reference: Modified EPA SW846 Methods 5030/ 8260			
PHENOLS-4AAP-WT	Soil	Phenol (4AAP)	EPA 9066
A manual method is used to distill the sample. The distillate is then buffered to pH 9.4 and reacts with 4AAP and alkaline ferricyanide to form a red complex which is measured colorimetrically.			
PREP-MOISTURE-SK	Soil	% Moisture	Oven dry 105C-Gravimetric
The weighed portion of soil is placed in a 105 C oven overnight. The dried soil is allowed to cooled to room temperature, weighed and the % moisture is calculated. Reference: ASTM D2216-80			

\*\* ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
SK	ALS ENVIRONMENTAL - SASKATOON, SASKATCHEWAN, CANADA
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

## Chain of Custody Numbers:

## GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample  
mg/kg wwt - milligrams per kilogram based on wet weight of sample  
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight  
mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



L1516163-COFC

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10-350603

Page 1 of 4

**Report To**  
 Company: PINTER & Associates  
 Contact: Ryan Riess / Wesley Wizinink  
 Address: 1710A 48th St. E  
Saskatoon SK S7K 5B4  
 Phone: 306-244-1210 Fax: 306-933-4986

**Report Format / Distribution**  
 Standard:  Other (specify):  
 Select: PDF  Excel  Digital  Fax   
 Email 1: ariesley.wizinink@pinter.ca  
 Email 2: ryan.riess@pinter.ca

**Client / Project Information**  
 Job #: 1607-2  
 PO / AFE: 1607-2  
 LSD: \_\_\_\_\_  
 Quote #: Q37502  
 ALS Contact: \_\_\_\_\_  
 Sampler: \_\_\_\_\_

**Service Request** (Rush subject to availability - Contact ALS to confirm TAT)  
 Regular (Standard Turnaround Times - Business Days)  
 Priority (2-4 Business Days) - 50% surcharge - Contact ALS to confirm TAT  
 Emergency (1-2 Business Days) - 100% surcharge - Contact ALS to confirm TAT  
 Same Day or Weekend Emergency - Contact ALS to confirm TAT

**Analysis Request**  
 (Indicate Filtered or Preserved, F/P)

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mm-yy)	Time (hh:mm)	Sample Type	Number of Containers
1	1607-2 HAH-1-A	04-Sept-14		Soil	2
2	1607-2 HAH-2-A				2
3	1607-2 HAH-3-A				2
4	1607-2 HAH-4-A				2
5	1607-2 HAH-5-A				2
6	1607-2 HAH-6-A				2
7	1607-2 HAH-7-A				2
8	1607-2 HAH-8-A				2
9	1607-2 HAH-9-A				2
10	1607-2 HAH-10-A				2
11	1607-2 HAH-11-A				2
12	1607-2 HAH-12-A				2

**Special Instructions** Regulation with water or land use (CCME, Freshwater, Aquatic Life/BC, CSF, Commercial/AB, Tie, Natural/EIC) Hazardous Details

**SHIPMENT RELEASE (client use)**  
 Released by: [Signature] Date: 10 Sept 14 Time: \_\_\_\_\_

**SHIPMENT RECEPTION (lab use only)**  
 Received by: BK Date: 10 Sept 14 Time: \_\_\_\_\_  
 Temperature: 8 °C  
 Verified by: [Signature] Date: Sept 11 11:45 Time: \_\_\_\_\_

**SHIPMENT VERIFICATION (lab use only)**  
 Observations: Yes / No ?  
 if Yes add SIF

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

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L1516163-COFC

Service Request (Rush subject to availability - Contact ALS to confirm TAT)  
 Regular (Standard Turnaround Times - Business Days)  
 Priority (2-4 Business Days) - 50% surcharge - Contact ALS to confirm TAT  
 Emergency (1-2 Business Days) - 100% Surcharge - Contact ALS to confirm TAT  
 Same Day or Weekend Emergency - Contact ALS to confirm TAT

Report Format / Distribution

Standard:  Other (specify):  
 Excel  Digital  Fax  
 Select PDF  Email 1: wesley.wizniuk@pinter.ca  
 Email 2: cynthia.ross@pinter.ca

Client / Project Information

Client: 306-933-4986  
 Job #: 1607-2  
 PO / A/E:  
 LSD:

Analysis Request

(Indicate Filtered or Preserved, FIP)

Sample #	Lab Work Order # (lab use only)	Sample Identification	ALS Contact	Date (dd-mm-yy)	Time (hh:mm)	Sampler	Sample Type	Hazardous Details
13	1607-2	<del>HAH-13-B</del> DUPE - 9		05-Sept-14			Soil	
14		HAH-14-B						
15		HAH-15-B						
16		HAH-16-B						
17		HAH-17-B						
18		HAH-18-B						
19		HAH-19-B						
20		<del>HAH-20-B</del> DUPE - 14-B						
21		HAH-20-B						
22		HAH-21-B						
23		HAH-22-B						
24								

PHENOL  
 BTEX, STYRENE

Quote #: Q37502

ALS Contact:

Date

Time

Sampler

Sample Type

Special Instructions: Registration with water or land use (CCMF, Freshwater, Aquatic, Life, BC, CSR, Commercial/AB, Tier 1, Natural/ETC) Hazardous Details

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SHIPMENT RECEIPT (lab use only)

SHIPMENT VERIFICATION (lab use only)

Temperature:

Time:

Date:

Verified by:

WHITE - LABORATORY COPY

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SHIPMENT RELEASE (client use)

Date:

Time:

Received by:

SHIPMENT RECEIPT (lab use only)

SHIPMENT VERIFICATION (lab use only)

Temperature:

Time:

Date:

Verified by:

WHITE - LABORATORY COPY

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SHIPMENT RELEASE (client use)

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Date:

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Received by:

SHIPMENT RECEIPT (lab use only)

SHIPMENT VERIFICATION (lab use only)

Temperature:



L1516163-COFC

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Page 3 of 4

<b>Report To</b>		<b>Report Format / Distribution</b>		<b>Service Request</b> (Rush subject to availability - Contact ALS to confirm TAT)	
Company: <b>PINTEK &amp; ASSOCIATES</b>		Standard: <input checked="" type="checkbox"/> Other (specify):		<input checked="" type="checkbox"/> Regular (Standard Turnaround Times - Business Days)	
Contact: <b>Wesley Wisniewski / Ryan Riess</b>		Select: PDF <input checked="" type="checkbox"/> Excel <input checked="" type="checkbox"/> Digital <input checked="" type="checkbox"/> Fax		<input type="checkbox"/> Priority (2-4 Business Days) 50% surcharge - Contact ALS to confirm TAT	
Address: <b>710A 48th St. East Saskatoon, SK S7K 5B4</b>		Email 1: <b>wesley.wisniewski@pinter.ca</b>		<input type="checkbox"/> Emergency (1-2 Business Days) 100% Surcharge - Contact ALS to confirm TAT	
Phone: <b>306-244-1710</b> Fax: <b>306-933-4986</b>		Email 2: <b>ryan.riess@pinter.ca</b>		<input type="checkbox"/> Same Day or Weekend Emergency - Contact ALS to confirm TAT	
<b>Invoice To</b> Same as Report? (circle Yes or No) (if No, provide details)		<b>Client / Project Information</b>		<b>Analysis Request</b>	
Copy of Invoice with Report? (circle Yes or No)		Job #: <b>1607-2</b>		(Indicate Filtered or Preserved, F/P)	
Company:		PO / AFE:			
Contact:		LSD:			
Address:		Quote #: <b>Q.3750Z</b>			
Phone:		ALS Contact:			
Fax:		Sampler:			
Lab Work Order # (lab use only)		Date (dd-mm-yy)		Time (h:mm)	
Sample Identification (This description will appear on the report)		Date		Time	
Sample #					Sample Type
25	1607-2	HAH - 23-B	05-Sept-14		Soil
26		HAH - 24-B			
27		HAH - 25-B			
28		HAH - 26-B			
29		HAH - 27-B			
30		HAH - 28-B			
31		HAH - 29-B			
32		DIAPY - 29-B			
33		HAH - 30-B			
34		HAH - 31-B			
35		HAH - 32-B			
36		HAH - 33-B			
Special Instructions / Regulation: With water or land use (CCME, Freshwater, Aquatic Life, BC, CSR, Commercial, AB, Tier 1, Natural, ETC.) Hazardous Details					
Number of Containers					
PHENOL					
BTX, STYRENE					

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

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<b>SHIPMENT RELEASE (client use)</b>		<b>SHIPMENT RECEPTION (lab use only)</b>		<b>SHIPMENT VERIFICATION (lab use only)</b>	
Released by: <b>Wesley Wisniewski</b>	Date: <b>10 Sept 14</b>	Received by: <b>BFE</b>	Date: <b>10 Sept 14</b>	Verified by: <b>OCAD</b>	Date: <b>Sept 11 9:45</b>
Time: <b>10:00</b>		Time: <b>15:40</b>		Time: <b>9:45</b>	
Observations: <b>None</b>		Observations: <b>None</b>		Observations: <b>None</b>	

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

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www.aisglobal.com

10-351027

Page 4 of 4

Report To		Report Format / Distribution		Service Request (Rush subject to availability - Contact ALS to confirm TAT)	
Company: PINTER & Associates		Standard: <input checked="" type="checkbox"/> Other (specify):	<input checked="" type="checkbox"/> Regular (Standard Turnaround Times - Business Days)		
Contact: Wesley Wizeniuk / Ryan Riess		Select: PDF <input checked="" type="checkbox"/> Excel <input checked="" type="checkbox"/> Digital <input checked="" type="checkbox"/> Fax	<input type="checkbox"/> Priority (2-4 Business Days)-50% surcharge - Contact ALS to confirm TAT		
Address: 7104 48th St E. Saskatchewan, SK		Email 1: wesley.wizeniuk@pinter.ca	<input type="checkbox"/> Emergency (1-2 Business Days)-100% Surcharge - Contact ALS to confirm TAT		
57K 5B4		Email 2: ryan.riess@pinter.ca	<input type="checkbox"/> Same Day or Weekend Emergency - Contact ALS to confirm TAT		
Phone: 306-244-1716 Fax: 306-933-4986		Analysis Request			
Invoice To: Same as Report? (circle) (Yes) or No (No)		(Indicate Filtered or Preserved, F/P)			
Company: Copy of Invoice with Report? (circle) Yes or No					
Contact:					
Address:					
Phone:					
Fax:					
Quote #: 37502					
ALS Contact:					
Lab Work Order #: (lab use only)					
Sample #	Sample Identification (This description will appear on the report)	Date (dd-mm-yy)	Time (hh:mm)	Sample Type	Number of Containers
37	HAH-34-B	05-Sept-14		Soil	2
38	HAH-35-B				2
39	HAH-36-B				2
40	HAH-37-B				2
41	HAH-38-B				2
42	HAH-39-B				2
43	DUPE-39-B				1
44	HAH-40-B				2
				PHENOL	
				BTEX, STYRENE	

Special Instructions: (Regulation with water or land use (CCME - Freshwater/Aquatic Life/BC CSE-Commercial/AB Tier 1-Natural/ETC) / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

SHIPMENT RELEASE (client use)		SHIPMENT RECEPTION (lab use only)		SHIPMENT VERIFICATION (lab use only)	
Released by: <i>Wesley Wizeniuk</i>	Date: 10 Sept 14	Received by: <i>RS</i>	Date: 05 Sept 14	Verified by: <i>AD</i>	Date: 07 Sept 14
	Time: 10:00		Time: 15:00		Time: 09:45
			Temperature: 8 °C		Observations: Yes (No) if Yes add SIF

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

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RR



**PINTER**  
& ASSOCIATES LTD

**Appendix F**  
**NCSCS Prescreen**

**CCME National Classification System for Contaminated Sites (2008, 2010 v 1.2)  
Pre-Screening Checklist**

Question	Response (yes / no)	Comment
1. Are <b>Radioactive material, Bacterial contamination or Biological hazards</b> likely to be present at the site?	No	If yes, do not proceed through the NCSCS. Contact applicable regulatory agency immediately.
2. Are there <b>no contamination exceedances</b> (known or suspected)? Determination of exceedances may be based on: 1) CCME environmental quality guidelines; 2) equivalent provincial guidelines/standards if no CCME guideline exists for a specific chemical in a relevant medium; or 3) toxicity benchmarks derived from the literature for chemicals not covered by CCME or provincial guidelines/standards.	Yes	If yes (i.e., there are no exceedances), do not proceed through the NCSCS.
3. Have <b>partial/incompleted or no environmental site investigations</b> been conducted for the Site?	No	If yes, do not proceed through the NCSCS.
4. Is there direct and significant evidence of <b>impacts to humans</b> at the site, or off-site due to migration of contaminants from the site?	No	If yes, automatically rate the site as Class 1, a priority for remediation or risk management, regardless of the total score obtained should one be calculated (e.g., for comparison with other Class 1 sites).
5. Is there direct and significant evidence of <b>impacts to ecological receptors</b> at the site, or off-site due to migration of contaminants from the site?	No	Some low levels of impact to ecological receptors are considered acceptable, particularly on commercial and industrial land uses. However, if ecological effects are considered to be severe, the site may be categorized as Class 1, regardless of the numerical total NCSCS score. For the purpose of application of the NCSCS, effects that would be considered severe include observed effects on survival, growth or reproduction which could threaten the viability of a population of ecological receptors at the site. Other evidence that qualifies as severe adverse effects may be determined based on professional judgement and in consultation with the relevant jurisdiction.
6. Are there indicators of significant <b>adverse effects in the exposure zone</b> (i.e., the zone in which receptors may come into contact with contaminants)? Some examples are as follows: -Hydrocarbon sheen or NAPL in the exposure zone -Severely stressed biota or devoid of biota; -Presence of material at ground surface or sediment with suspected high concentration of contaminants such as ore tailings, sandblasting grit, slag, and coal tar.	No	If yes, automatically rate the site as Class 1, a priority for remediation or risk management, regardless of the total score obtained should one be calculated (e.g., for comparison with other Class 1 sites).
7. Do measured concentrations of volatiles or unexploded ordnances represent an <b>explosion hazard</b> ?	No	If yes, automatically rate the site as Class 1, a priority for remediation or risk management, and do not continue until the safety risks have been addressed. Consult your jurisdiction's occupational health and safety guidance or legislation on explosive hazards and measurement of lower explosive limits.

If none of the above applies, proceed with the NCSCS scoring.

## **Appendix G**

**Saskatchewan Ministry of Environment**

**Hazardous Materials Storage and Spills**

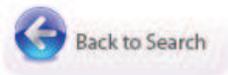


# Spills Search

We are currently improving how this information is displayed. For spills reported after January 1, 2020, please go to our new GeoHub page: [Environment \(arcgis.com\)](https://environment.arcgis.com)

## Spills Search Results

Your search for spills with the Legal Land Description NE-35-35-4-3 produced **no results**



Spill/Incident Number	Spill Date	Contaminant	Quantity	Address	Title Description	Lat/Long	Legal Land Description
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No Results were found matching your required search parameters.

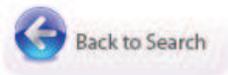


# Spills Search

We are currently improving how this information is displayed. For spills reported after January 1, 2020, please go to our new GeoHub page: [Environment \(arcgis.com\)](https://environment.arcgis.com)

## Spills Search Results

Your search for spills matching keyword **Range Road 3011** in CLAVET produced **no results**



Spill/Incident Number	Spill Date	Contaminant	Quantity	Address	Title Description	Lat/Long	Legal Land Description
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No Results were found matching your required search parameters.

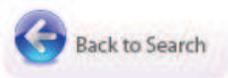


# Spills Search

We are currently improving how this information is displayed. For spills reported after January 1, 2020, please go to our new GeoHub page: [Environment \(arcgis.com\)](https://environment.arcgis.com)

## Spills Search Results

Your search for spills matching keyword **Township 360** in CLAVET produced **no results**



Spill/Incident Number	Spill Date	Contaminant	Quantity	Address	Title Description	Lat/Long	Legal Land Description
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No Results were found matching your required search parameters.

We are currently improving how this information is displayed.  
For spills reported after January 1, 2020, please go to our new  
GeoHub page: [Environment \(arcgis.com\)](https://environment.arcgis.com)

## Spills Search Results

Your search for spills in CLAVET produced the following results


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Spill/Incident Number	Spill Date	Contaminant	Quantity	Address	Title Description	Lat/Long	Legal Land Description
1999-0470	6/8/1999	OTHER - 1151-0-PHOSPHATE	6000 Kg	CLAVET		52°01'51"N, 106°23'28"W	SE 29-35-3 3
2002-0060	3/19/2002	Industrial Waste - BRYNE	Unknown	12ME OF SASKATOON 6-7M NORTH OF CLAVET, CLAVET		52°02'50"N, 106°23'06"W	
	11/4/2004	SULFURIC ACID	400 L	Clavet			
60126	4/20/2006	OTHER - LIQUID FERTILIZER 2800	212 KG	Clavet			

2/9/22, 3:26 PM

## Sask Spills - Spills Search

60165	5/15/2006	AMMONIA - 2800 UAW URUA AMONIA NITRATE LIQUID FERTILIZER	1000 KG	Clavet			
70405	9/17/2007	OTHER - round up credit-no hazard weed spray	100 L	Clavet			
80503	11/18/2008	POTASSIUM - POTASH BRINE 7200 GALLONS	27250 L	Clavet			
100466	9/23/2010	OIL&GREASE - Unknown amount of oil	0 L	Clavet			SE 20-35-3 3
110583	10/24/2011	OTHER - Unknown amount of Amonium Thyosulfate Solution (15% Nitrogen, 20% Sulfate)	0 L	NW 36-34-03 W3M, Clavet			NW 36-34-3 3
130194	4/23/2013	UREA - Urea ammonium nitrate liquid (UAN)	300 KG	Agrium Clavet Distribution, Clavet			NW 36-34-3 3
130678	11/27/2013	OTHER - BRINE- SODIUM CHLORIDE & POTASSIUM CHLORIDE	0 L	In mine field, Clavet			NW 14-36-3 3
130683	11/28/2013	OTHER - BRINE (SODIUM/POTASSIUM CHLORIDE)	34000 L	Clavet			SE 4-36-3 3
140248	4/28/2014	DIESEL FUEL LIQ - Report Id: 2014-04-28T10:11:15	454.25 L	Clavet			
15230	7/7/2015	OIL&GREASE - Report ID: 2015-07-07T14:30:10	420000 L	Clavet			
180140	5/7/2018	OTHER - Canola Oil - Discharge Case #2018-05-07T09:23:35	2500 KG	1 Cheviot Rd North, Clavet		52°02'99"N, 106°40'46"W	SW 29-35-3 3

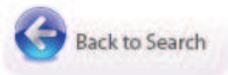


# Spills Search

We are currently improving how this information is displayed. For spills reported after January 1, 2020, please go to our new GeoHub page: [Environment \(arcgis.com\)](https://environment.arcgis.com)

## Spills Search Results

Your search for spills matching keyword **Freeborn** in CLAVET produced **no results**



Spill/Incident Number	Spill Date	Contaminant	Quantity	Address	Title Description	Lat/Long	Legal Land Description
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No Results were found matching your required search parameters.

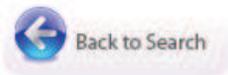


# Spills Search

We are currently improving how this information is displayed. For spills reported after January 1, 2020, please go to our new GeoHub page: [Environment \(arcgis.com\)](https://environment.arcgis.com)

## Spills Search Results

Your search for spills matching keyword **HWY 16** in CLAVET produced **no results**



Spill/Incident Number	Spill Date	Contaminant	Quantity	Address	Title Description	Lat/Long	Legal Land Description
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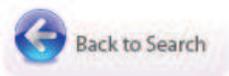
No Results were found matching your required search parameters.



## Hazardous Substance Storage Facility Search

### Hazardous Storage Search Results

Your search for Hazardous Storage matching keyword **Range Road 3011** in CLAVET produced **no results**



Spill/Incident Number Operation ID	Operation Name	Address	Legal Land Description	Operation Status
---------------------------------------	----------------	---------	------------------------	------------------

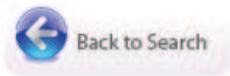
No Results were found matching your required search parameters.



## Hazardous Substance Storage Facility Search

### Hazardous Storage Search Results

Your search for Hazardous Storage matching keyword **Township 360** in CLAVET produced *no results*



Spill/Incident Number Operation ID	Operation Name	Address	Legal Land Description	Operation Status
---------------------------------------	----------------	---------	------------------------	------------------

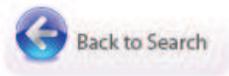
No Results were found matching your required search parameters.



## Hazardous Substance Storage Facility Search

### Hazardous Storage Search Results

Your search for Hazardous Storage matching keyword **Freeborn** in CLAVET produced *no results*



Spill/Incident Number Operation ID	Operation Name	Address	Legal Land Description	Operation Status
---------------------------------------	----------------	---------	------------------------	------------------

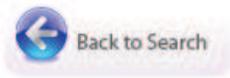
No Results were found matching your required search parameters.



## Hazardous Substance Storage Facility Search

### Hazardous Storage Search Results

Your search for Hazardous Storage matching keyword **HWY 16** in CLAVET produced **no results**



Spill/Incident Number Operation ID	Operation Name	Address	Legal Land Description	Operation Status
---------------------------------------	----------------	---------	------------------------	------------------

No Results were found matching your required search parameters.



## Hazardous Substance Storage Facility Search

### Hazardous Storage Search Results

Your search for Hazardous Storage matching keyword with the Legal Land Description NE-35-35-4-3 produced the following results

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Spill/Incident Number Operation ID	Operation Name	Address	Legal Land Description	Operation Status
7091	FRP MANUFACTURING INC. STORAGE SITE	R.R. #5 SITE 501 Box 11, SASKATOON	NE 35-35-4 3	Operating



## Hazardous Substance Storage Facility Search

### Hazardous Storage Search Results

Your search for Hazardous Storage matching keyword in CLAVET produced the following results



Spill/Incident Number Operation ID	Operation Name	Address	Legal Land Description	Operation Status
4618	CARGILL LTD. (CLAVET) STORAGE SITE	CHEVIOT ROAD, CLAVET		Operating
11135	NEEN'S NOOK STORAGE SITE	HWY #16 & MAIN ST., CLAVET		Operating
11744	CLAVET SERVICE STATION LTD. STORAGE SITE	BOX 218, CLAVET	SW 16-35-3 3	Decommissioning
12168	AMIGOS AUTOWRECKING LTD. STORAGE SITE	PARCEL H, CLAVET		Operating
62576	NEEN'S NOOK (DOMO), HWY 316 AND HWY16, NEAR CLAVET, STORAGE SITE	SW1/4-SEC21-35-03-W3M (HWY 316 AND 16), CLAVET	SW 21-35-3 3	Operating

**Appendix H**  
**Water Security Agency Driller Water**  
**Well Reports**

Well Name: CANADA CEMENT

WWDR #: 052944

**Well Location**

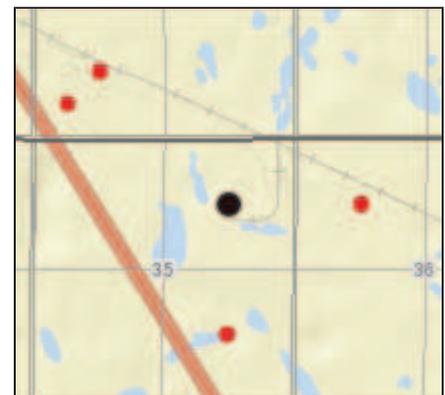
Land Location	NE-35-035 -04 -W3	Location of Well (in Quarter)
LSD	00	0 ft from N/S Boundary
Reserve		0 ft from E/W Boundary
RM:		
NTS Map:	73B00	Major Basin: 06
Elevation (ft)	1700	SubBasin: 30
Aquifer		

**Well Information**

Driller	INTERNATIONAL WATER SUPPLY LTD	Length (ft)	122	Well Casings	Btm (ft)	122	Dia (in)	6.5	Material	Steel
Completion Date	1964.04.29		0			0		0		
Hole #			0			0		0		
Install Method	Drilled									
Borehole Depth (ft)	123			Well Screens						
Bit Dia (in)	5	Length (ft)	0	Bottom (ft)	0	Dia (in)	0	Slot (in)	0	Material
Water Level	18		0		0		0		0	
Flowing Head	0		0		0		0		0	
Water Use	Domestic									
Well Use	Withdrawal			Pump Test						
Completion Method	Unknown			Draw Down					0 ft	
E-Log	No			Duration					0 hrs	
				Pumping Rate					80 igpm	
				Temperature					0 deg. F	
				Rec. Pumping Rate					0 igpm	

**Lithology List**

Depth (ft):	Material	Colour	Description
123	Unknown	Unknown	Unknown



Well Name: SCHMIDT FARMS LTD

WWDR #: 071256

**Well Location**

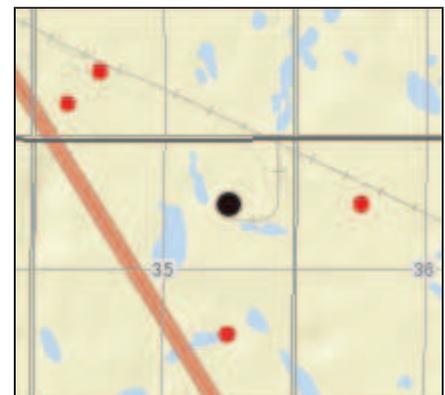
Land Location	NE-35-035 -04 -W3	Location of Well (in Quarter)
LSD	00	0 ft from N/S Boundary
Reserve		0 ft from E/W Boundary
RM:		
NTS Map:	73B00	Major Basin: 06
Elevation (ft)	1675	SubBasin: 30
Aquifer		

**Well Information**

Driller	TWEIDT WELLBORING SERVICING LTD	Length (ft)	0	Btm (ft)	0	Dia (in)	0	Material	
Completion Date	1982.05.06	0	0	0	0	0	0		
Hole #		0	0	0	0	0	0		
Install Method	Augered								
Borehole Depth (ft)	40								
Bit Dia (in)	6	Length (ft)	Bottom (ft)	Dia (in)	Slot (in)	Material			
Water Level	0	0	0	0	0	0			
Flowing Head	0	0	0	0	0	0			
Water Use	Domestic								
Well Use	Water Test Hole	Draw Down					0 ft		
Completion Method		Duration					0 hrs		
E-Log	No	Pumping Rate					0 igpm		
		Temperature					0 deg. F		
		Rec. Pumping Rate					0 igpm		

**Lithology List**

Depth (ft):	Material	Colour	Description
1	Topsoil	Unknown	Unknown
20	Clay	Yellow	Dry
40	Clay	Blue	Dry



Well Name: CANADA CEMENT

WWDR #: 031768

**Well Location**

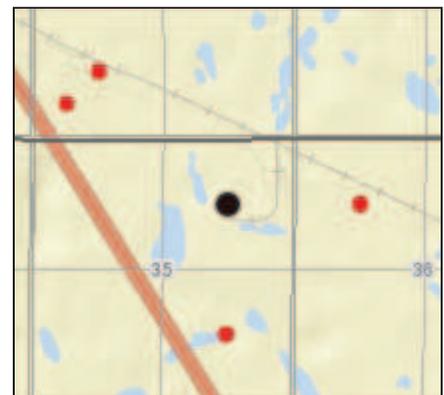
Land Location	NE-35-035 -04 -W3	Location of Well (in Quarter)
LSD	00	0 ft from N/S Boundary
Reserve		0 ft from E/W Boundary
RM:		
NTS Map:	73B00	Major Basin: 06
Elevation (ft)	1700	SubBasin: 30
Aquifer		

**Well Information**

Driller	INTERNATIONAL WATER SUPPLY LTD	Length (ft)	0	Btm (ft)	0	Dia (in)	0	Material
Completion Date		0	0	0	0	0	0	
Hole #		0	0	0	0	0	0	
Install Method	Drilled							
Borehole Depth (ft)	370							
Bit Dia (in)	4.7	0	0	0	0	0	0	
Water Level	0	0	0	0	0	0	0	
Flowing Head	0	0	0	0	0	0	0	
Water Use	Industrial							
Well Use	Water Test Hole	Draw Down					0 ft	
Completion Method		Duration					0 hrs	
E-Log	No	Pumping Rate					0 igpm	
		Temperature					0 deg. F	
		Rec. Pumping Rate					0 igpm	

**Lithology List**

Depth (ft):	Material	Colour	Description
1	Topsoil	Unknown	Unknown
20	Clay	Brown	Stoney
70	Clay	Grey	Stoney
90	Sandy Clay	Grey	Soft
99	Clay	Grey	Boulders
100	Limestone	Unknown	Unknown
103	Clay	Grey	Stoney
122	Sandy Clay	Unknown	Silty
247	Clay	Grey	Boulders
248	Gravel	Unknown	Unknown
256	Clay	Grey	Stoney
280	Shale	Unknown	Unknown
370	Shale	Unknown	Sand Streaks



Well Name: SCHMIDT

WWDR #: 031749

**Well Location**

Land Location	SE-35-035 -04 -W3	Location of Well (in Quarter)
LSD	00	0 ft from N/S Boundary
Reserve		0 ft from E/W Boundary
RM:		
NTS Map:	73B00	Major Basin: 06
Elevation (ft)	1700	SubBasin: 30
Aquifer	Glac	

**Well Information**

Driller	UNKNOWN	Length (ft)	0	Btm (ft)	0	Dia (in)	0	Material	Corrugated Metal
Completion Date	1935.07.01		0		0		0		Concrete
Hole #			0		0		0		
Install Method	Unknown								
Borehole Depth (ft)	116								
Bit Dia (in)	36	Length (ft)	0	Bottom (ft)	0	Dia (in)	0	Slot (in)	0
Water Level	10		0		0		0		0
Flowing Head	0		0		0		0		0
Water Use	Domestic								
Well Use	Withdrawal								
Completion Method	Curbed								
E-Log	No								


**Lithology List**

Depth (ft):	Material	Colour	Description
-------------	----------	--------	-------------



Well Name: SCHMIT FARMS LTD

WWDR #: 108665

**Well Location**

Land Location	SE-35-035 -04 -W3	Location of Well (in Quarter)	
LSD	00	800 ft from N/S Boundary	N
Reserve		200 ft from E/W Boundary	E
RM:	344		
NTS Map:	73B01	Major Basin:	06
Elevation (ft)	1706	SubBasin:	30
Aquifer			

**Well Information**

Driller	MITCHELL DRILLING (1979) LTD	Length (ft)	Btm (ft)	Dia (in)	Material
Completion Date	1997.07.30	103	100	5	P.V.C.
Hole #	001	0	0	0	
Install Method	Drilled	0	0	0	
Borehole Depth (ft)	120	<b>Well Screens</b>			
Bit Dia (in)	5.1	Length (ft)	Bottom (ft)	Dia (in)	Slot (in)
Water Level	15	15	115	5	20
Flowing Head	0	0	0	0	0
Water Use	Domestic	0	0	0	0
Well Use	Withdrawal	<b>Pump Test</b>			
Completion Method	Well Screen And Gravel	Draw Down	90 ft		
E-Log	Pack SCANNED	Duration	10 hrs		
		Pumping Rate	1 igpm		
		Temperature	44 deg. F		
		Rec. Pumping Rate	1 igpm		

**Lithology List**

Depth (ft):	Material	Colour	Description
23	Clay	Brown	Oxidized
33	Clay	Grey	Hard
98	Till	Grey	Hard
115	Sand	Unknown	Fine
120	Till	Grey	Hard



Well Name: UNKNOWN

WWDR #: 220240

**Well Location**

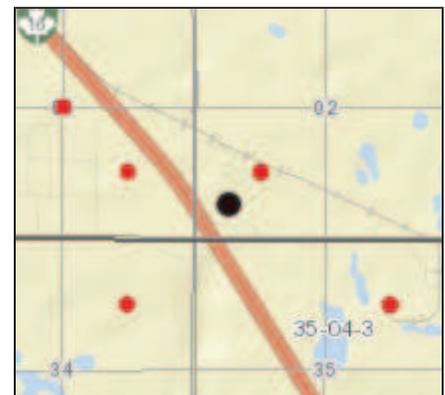
Land Location	SW-02-036 -04 -W3	Location of Well (in Quarter)
LSD	04	0 ft from N/S Boundary
Reserve		0 ft from E/W Boundary
RM:	344	
NTS Map:	73B01	Major Basin: 06
Elevation (ft)	1712	SubBasin: 30
Aquifer		

**Well Information**

Driller	UNKNOWN	Well Casings			
		Length (ft)	Btm (ft)	Dia (in)	Material
Completion Date		0	0	0	
Hole #	00000001	0	0	0	
Install Method		Well Screens			
Borehole Depth (ft)	3206	Length (ft)	Bottom (ft)	Dia (in)	Slot (in)
Bit Dia (in)	0	0	0	0	0
Water Level	0	0	0	0	0
Flowing Head	0	0	0	0	0
Water Use		Pump Test			
Well Use		Draw Down	0 ft		
Completion Method		Duration	0 hrs		
E-Log		Pumping Rate	0 igpm		
		Temperature	0 deg. F		
		Rec. Pumping Rate	0 igpm		

**Lithology List**

Depth (ft):	Material	Colour	Description
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Well Name: FLORAL SCHOOL UNIT

WWDR #: 031769

**Well Location**

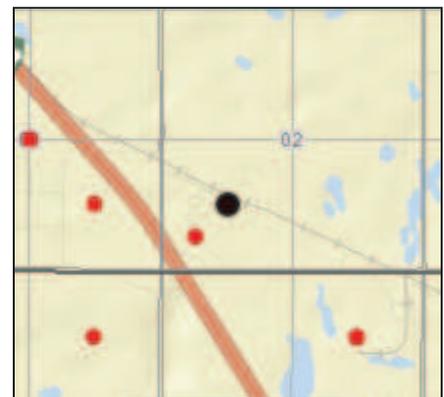
Land Location	SW-02-036 -04 -W3	Location of Well (in Quarter)
LSD	00	0 ft from N/S Boundary
Reserve		0 ft from E/W Boundary
RM:		
NTS Map:	73B00	Major Basin: 06
Elevation (ft)	1700	SubBasin: 30
Aquifer	Glac	

**Well Information**

Driller	UNKNOWN	Length (ft)	0	Btm (ft)	0	Dia (in)	0	Material	Wood
Completion Date	1950.08.19		0		0		0		
Hole #			0		0		0		
Install Method	Unknown								
Borehole Depth (ft)	22	Well Screens							
Bit Dia (in)	48	Length (ft)	Bottom (ft)	Dia (in)	Slot (in)	Material			
Water Level	20	0	0	0	0				
Flowing Head	0	0	0	0	0				
Water Use	Domestic	Pump Test							
Well Use	Withdrawal	Draw Down				0	ft		
Completion Method	Curbed	Duration				0	hrs		
E-Log	No	Pumping Rate				0	igpm		
		Temperature				0	deg. F		
		Rec. Pumping Rate				0	igpm		

**Lithology List**

Depth (ft):	Material	Colour	Description
22	Sand	Unknown	Unknown





Well Name: NEW LIFE MILLS

WWDR #: 236506

**Well Location**

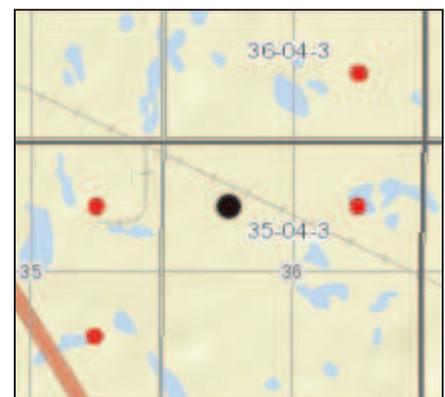
Land Location	NW-36-035 -04 -W3	Location of Well (in Quarter)
LSD	00	0 ft from N/S Boundary
Reserve		0 ft from E/W Boundary
RM:	344	
NTS Map:	73B01	Major Basin: 06
Elevation (ft)	1712	SubBasin: 30
Aquifer		

**Well Information**

Driller	PARKLAND DRILLING SERVICES INC	Length (ft)	Btm (ft)	Dia (in)	Material
Completion Date	2015.10.08	127	124	5	P.V.C.
Hole #	00000001	0	0	0	
Install Method	Drilled				
Borehole Depth (ft)	320				
Bit Dia (in)	5.8	10	134	5	12
Water Level	0	0	0	0	0
Flowing Head	0	0	0	0	0
Water Use	Domestic				
Well Use	Withdrawal	Draw Down			0 ft
Completion Method	Well Screen And Gravel Pack	Duration			9 hrs
E-Log	Yes	Pumping Rate			90 igpm
		Temperature			36 deg. F
		Rec. Pumping Rate			50 igpm

**Lithology List**

Depth (ft):	Material	Colour	Description
12	Clay	Brown	Unknown
62	Clay	Blue	Rocky
64	Gravel	Unknown	Rocky
102	Clay	Blue	Rocky
122	Clay	Blue	Hard
135	Sand	Unknown	Medium-coarse
220	Clay	Blue	Rocky
225	Sand	Unknown	Fine
280	Clay	Blue	Unknown
320	Shale	Unknown	Unknown



Well Name: NEW LIFE FEEDS

WWDR #: 236502

**Well Location**

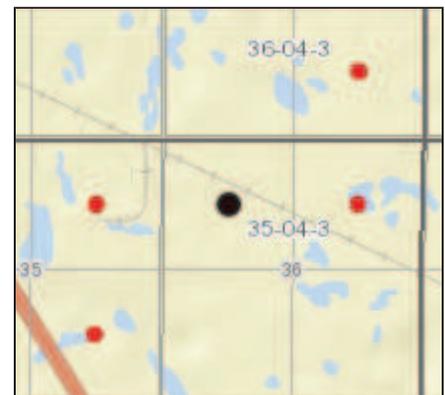
Land Location	NW-36-035 -04 -W3	Location of Well (in Quarter)
LSD	00	0 ft from N/S Boundary
Reserve		0 ft from E/W Boundary
RM:	344	
NTS Map:	73B01	Major Basin: 06
Elevation (ft)	1712	SubBasin: 30
Aquifer		

**Well Information**

Driller	PARKLAND DRILLING SERVICES INC	Length (ft)	Btm (ft)	Dia (in)	Material
Completion Date	2015.08.28	125	123	5	P.V.C.
Hole #	00000001	0	0	0	
Install Method	Drilled				
Borehole Depth (ft)	160				
Bit Dia (in)	5.8	10	133	5	12
Water Level	0	0	0	0	0
Flowing Head	0	0	0	0	0
Water Use	Domestic				
Well Use	Withdrawal	Draw Down			0 ft
Completion Method	Well Screen And Gravel	Duration			4 hrs
E-Log	Pack Yes	Pumping Rate			60 igpm
		Temperature			0 deg. F
		Rec. Pumping Rate			25 igpm

**Lithology List**

Depth (ft):	Material	Colour	Description
18	Clay	Brown	Soft
82	Clay	Blue	Rocky
100	Silt	Unknown	Sand Streaks
123	Clay	Blue	Hard
134	Sand	Unknown	Medium-coarse
160	Clay	Blue	Soft



## **Appendix I**

### **Select Subject Property Photographs**

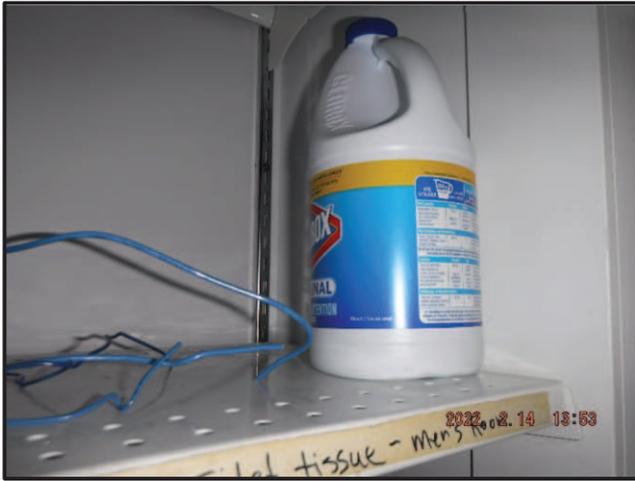


Photo 1: Small quantities of household cleaning materials observed on a metal surface in a cleaning closet of the Subject Property building.



Photo 2: Multiple cans of paint were observed on the concrete surface of the vacant office space.



Photo 3: Multiple pails of paint were observed on the concrete surface of the vacant office space.



Photo 4: Empty and full containers of commercial-grade alcohol were observed on a cardboard box and concrete surface in the laboratory.



Photo 5: A floor drain was observed in the washrooms of the Subject Property.



Photo 6: Multiple fire extinguishers were observed throughout the Subject Property.



Photo 7: Multiple refrigeration units were observed throughout the Subject Property building.



Photo 8: Watermarks were observed in the boardroom of the building.



Photo 9: Watermarks were observed in the kitchen of the building.



Photo 10: An on-site transformer was observed in a wooden containment box near the north exterior wall of the building.

**Appendix J**  
**Statement of Qualifications**



## **Statement of Qualifications, Environmental Site Assessment**

This is a brief statement of qualifications as requested. The statement is specific to the background of PINTER & Associates Ltd. (PINTER) and PINTER personnel.

PINTER has performed hundreds of environmental site assessments (ESA). These studies include Phase I ESAs to the follow-up Phase II and Phase III studies. PINTER has over thirty years of cumulative experience in conducting ESAs. PINTER provides a fully insured environmental site assessment service.

Our team has experience with a broad range of environmental issues and contaminants including moulds and fungi, agricultural chemicals, petroleum hydrocarbons, heavy metals, PCBs, dioxins and furans, asbestos, etc. They have assessed a variety of commercial, industrial and agricultural enterprises including; chemical plants, pulp mills, sawmills, OSB plants, farming operations, gas bars, scrap and salvage yards, commercial malls, schools, residential high rises, etc.

The skills and knowledge basis of the individual members of our team range from geotechnical engineering, environmental engineering, biology, geology, analytical chemistry, soil sciences, and soil reclamation.

PINTER has acted as a turnkey project manager for many clients in phase III remediation projects. We find that our expertise in working with senior technical and engineering people assist clients unfamiliar with the environmental industry to obtain the most cost effective price.

Our client list includes: private individuals, first nations, government agencies, industrial clients and commercial enterprises.

A black rectangular box containing a white, handwritten signature in cursive script, which appears to read "L. Pinter".

Lawrence G. Pinter, P.Eng.  
Principal/Project Manager



**PINTER**  
& ASSOCIATES LTD

# **Appendix I**

## **Drainage Plan**



**PINTER**  
& ASSOCIATES LTD

22 December 2022

File Number: 21-2880-003

101046965 Saskatchewan Ltd.  
Box 103 Site 601 RR6  
Saskatoon, SK S7K 3J9

**Subject: Technical Memo – Updated Engineered Drainage Plan for Land Development at NE-35-35-04-W3M, RM of Corman Park No. 344, Saskatchewan**

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PINTER & Associates Ltd. (PINTER) is pleased to provide this updated drainage plan as part of the application to subdivide the land located on lot NE 1/4 35-35-4-W3M (the Site), in the Rural Municipality of Corman Park (RM). As part of the subdivision application, a Comprehensive Development Review (CDR) will need to be submitted to the RM. The RM requires an updated engineered drainage plan as part of the servicing required to approve the subdivision application. 101046965 Saskatchewan Ltd. (the Client) requested PINTER to prepare an engineered drainage plan for the Site, considering the proposed subdivision plan (the Plan) dated 03 March 2022.

## **PROJECT BACKGROUND**

The Client submitted the revised Plan to the RM for approval. The Plan proposes to subdivide the Site into 8 lots, as shown in Figure 1 (Appendix A):

- Lot H covers an area of 1.20 hectares (ha) (2.97 Acres (ac));
- Lots F, G and J cover an area of 0.81 ha (2.01 ac), each, and
- Lots L, M, N and P cover an area of 0.87 ha (2.16 ac), each.

Two (2) drainage ditches exist to the north and west of the Site draining to a Municipal Reserve lagoon (the Lagoon) located at the south side of the Site. The Lagoon is approximately 170 metres (m) (length) x 40 (m) (width), measured from the Lagoon's top berm.

A building exists on Lot J covering an approximate area of 1,000 square metres (m<sup>2</sup>). Gravel pavement covers portions of Lots F, G, H and J. A low-lying area (depression) is located at the northeast corner of the Site (within Lot H). Soil stockpiles are stored at the Site within Lot H, which will be removed by the Client following the approval of the subdivision application.

## **REASON FOR UPDATING THE PLAN**

PINTER developed a drainage plan for the Site and submitted it to the RM on 24 March 2022. After initial approval of both the WSA and the RM, the RM explored other options including final storage at the Lagoon. Due to insufficient storage capacity at the Lagoon and following multiple discussions between the Client, PINTER and the RM, the RM suggested replacing separate storage ponds with two storage ponds (municipal utility ponds).

The RM asked PINTER for a few clarifications of the updated drainage plan and asked to incorporate these clarifications into the plan.

This updated plan incorporates the RM's suggestions with no change to the previously presented hydrological calculations. It also includes PINTER clarifications of the update.

## **DRAINAGE PLAN HYDROLOGICAL CALCULATIONS**

### **Site Survey**

Webb Surveyors (Webb) carried out a detailed topographic survey of the Site in September 2015. In February 2022, PINTER request an update of the 2015 survey to reflect any changes to the Site since the 2015 survey. Webb updated its survey in March 2022 and provided survey results and drawings to PINTER. The following hydrological calculations are based on the compiled survey results from the March 2022 survey.

Selected site photographs are presented in Appendix B.

### **Hydrological Calculations**

PINTER carried out detailed hydrological calculations to provide an engineered drainage plan that shows the following, as per the RM requirements<sup>1</sup>:

- (a) General topography of the Site, including pre-development/post-development drainage patterns;
- (b) Estimation of post-development runoff volumes;
- (c) Proposed onsite post-development runoff containment setup so as not to exceed pre-development rate of offsite flow for a 1:100 year storm event, and

---

<sup>1</sup> <https://rmcormanpark.ca/DocumentCenter/View/339/CDR-Information-Package-and-Checklist?bidId=>  
(Accessed 10 March 2022).

(d) Location of proposed offsite discharge points.

PINTER initially assumed that each lot will have the following land cover layout:

- Developed areas:
  - Impervious land cover (buildings, asphalt pavement, sidewalks, etc.) of an area that does not exceed 10% of the lot's total area, and
  - Semi-impervious land cover, i.e. landscaped area (parking lot gravel) of an area that does not exceed 10% of the lot's total area.
- Undeveloped areas do not exceed 80% of the total lot area.

PINTER used a conservative drainage design approach to account for potential development that exceeds the initial assumptions. The following design accommodates extreme changes to existing land cover layout up to the following:

- **Developed areas extend up to 80% of the total lot area.**
- **Undeveloped areas do not exceed 20% of the total lot area.**

**(a) Site Topography and Drainage Patterns**

**Pre-development:** The northeast portion of the Site (Lots G, H and portions of Lots J and F) is relatively flat with a maximum relief of approximately 0.40 m to the north/northeast directions. The southwest portion of the Site (Lots L, M, N, B and portion of Lot J) has a mild southwest slope towards the west drainage ditch with a maximum relief of approximately 1.00 m, as shown in Figure 2 (Appendix A).

Drainage from the Site is naturally drained to the north ditch which flows into the west ditches or directly from the Site to the west ditch. The west ditch flows towards the Lagoon south of the Site, with some overland pooling at the far southwest portion of the Site due to shallowness of its backslope (west ditch side slope close to the Site), as shown in Photographs in Appendix B.

**Post-development:** Each lot will be landscaped to follow its natural drainage pattern, as follows:

- Lots F, G and H will be landscaped to follow the natural drainage patterns to northeast and/or north directions (minimum 1.0-0.5 % slope);
- Lots J, L, M, N and P will be landscaped to follow the natural drainage pattern towards the west (minimum 1.0 % slope).

**(b) Post-development Peak Runoff Rates & Runoff Volumes**

PINTER uses two general runoff computation methods for runoff rates and volumes. These are the USDA Natural Resources Conservation Service (NRCS) methodology for runoff volumes and the Rational Method<sup>2</sup>. Runoff estimates from those methods are compared to the City of Saskatoon’s formulas<sup>3</sup>. PINTER selects the largest (conservative) estimate of either method as the design value for the specific lot within the project. Short duration rainfall Intensity-Duration-Frequency (IDF) data for the Saskatoon Diefenbaker International Airport meteorological station (Station # 4057120) is used to obtain storm characteristics for the Site. IDF curves and data are presented in Appendix C.

**Peak Runoff Rates:** Peak runoff rate is calculated using the Rational Method which uses an empirical linear equation to compute the peak runoff rate from a selected period of uniform rainfall intensity. The City of Saskatoon runoff coefficients for urban areas are used to estimate peak runoff rate for each lot. Tables 1a and 1b summarize hydrological characteristics of each lot for both development cases, i.e. development : un-development ratios of 20:80 and 80:20, respectively.

Appendix C presents the hydrological calculation sheets. Estimated peak runoff rates in cubic metres per second (m<sup>3</sup>/s) are listed in Tables 2a and 2b.

**Table 1a: Summary of Lots’ Hydrological Characteristics  
 (Low Development Scenario 20:80)**

Lot	Average Roughness Coefficient	Average Flow Length (m)	Travel Time (min)	Average Runoff Coefficient	
				Pre-Development	Post-Development
H	0.122	80	47.0	0.10	0.23
F	0.122	40	27.0	0.10	0.23
G	0.122	40	27.0	0.10	0.23
J	0.122	40	27.0	0.23	0.23
L	0.122	100	40.9	0.10	0.23
M	0.122	100	40.9	0.10	0.23
N	0.122	100	40.9	0.10	0.23

<sup>2</sup> United States Department of Agriculture (USDA) (2004) Estimation of Direct Runoff from Storm Rainfall – Chapter 10, Part 630 Hydrology-National Engineering Handbook, 210-VI-NEH.

<sup>3</sup> City of Saskatoon (2022) Design and Development Standards Manual: Section Six – Storm Water Drainage System, Version 14.

**Table 1a: Summary of Lots’ Hydrological Characteristics  
 (Low Development Scenario 20:80)**

Lot	Average Roughness Coefficient	Average Flow Length (m)	Travel Time (min)	Average Runoff Coefficient	
				Pre-Development	Post-Development
P	0.122	100	40.9	0.10	0.23

**Table 1b: Summary of Lots’ Hydrological Characteristics  
 (High Development Scenario 80:20)**

Lot	Average Roughness Coefficient	Average Flow Length (m)	Travel Time (min)	Average Runoff Coefficient	
				Pre-Development	Post-Development
H	0.039	80	18.8	0.10	0.61
F	0.039	40	10.8	0.10	0.61
G	0.039	40	10.8	0.10	0.61
J	0.039	40	10.8	0.23	0.61
L	0.039	100	16.4	0.10	0.61
M	0.039	100	16.4	0.10	0.61
N	0.039	100	16.4	0.10	0.61
P	0.039	100	16.4	0.10	0.61

**Table 2a: Peak Runoff Rates (m<sup>3</sup>/s)  
 (Low Development Scenario 20:80)**

Lot	Rational Method	City of Saskatoon Formula	Design Value
H	0.051	0.031	0.051
F	0.046	0.021	0.046
G	0.046	0.021	0.046
J	0.046	0.021	0.046
L	0.038	0.022	0.038
M	0.038	0.022	0.038
N	0.038	0.022	0.038
P	0.038	0.022	0.038
<b>Design Peak Runoff Rate for the Site</b>			<b>0.051</b>

**Table 2b: Peak Runoff Rates (m<sup>3</sup>/s)  
 (High Development Scenario 80:20)**

Lot	Rational Method	City of Saskatoon Formula	Design Value
H	0.173	0.083	0.173
F	0.137	0.056	0.137
G	0.137	0.056	0.137
J	0.068	0.028	0.068
L	0.133	0.060	0.133
M	0.133	0.060	0.133
N	0.133	0.060	0.133
P	0.133	0.060	0.133
<b>Design Peak Runoff Rate for the Site</b>			<b>0.173</b>

**Runoff Volumes:** Due to the nonlinearity of the NRCS runoff equation, mixture of pervious and directly connected-impervious surfaces within a drainage area (lot) causes differences in runoff estimates. As a conservative design approach, PINTER uses two calculation approaches: (1) weighted average NRCS Curve Number (CN), and (2) weighted average volume to calculate the corresponding runoff volume. Runoff off volumes in cubic metres (m<sup>3</sup>) are listed in Tables 3a and 3b.

PINTER’s conservative design approach. Uses the three calculation approaches: (1&2) 2 NRCS calculation methods, and (3) the City of Saskatoon Formula. The largest of the three numbers was selected to estimate the runoff volume from the specific lot.

**Table 3a: Runoff Volumes (m<sup>3</sup>)  
 (Low Development Scenario 20:80)**

Lot	NRCS Method	City of Saskatoon Formula	Design Value
H	79.1	96.7	96.7
F	53.4	65.3	65.3
G	53.4	65.3	65.3
J	62.1	58.6	62.1*
L	57.3	70.1	70.1
M	57.3	70.1	70.1
N	57.3	70.1	70.1
P	57.3	70.1	70.1
<b>Total Runoff Volume (Post-development) from the Site</b>			<b>569.8</b>

\* Lot J is already developed (existing building and gravel pavement). It is assumed that no further development will take place at that lot.

**Table 3b: Runoff Volumes (m<sup>3</sup>)  
 (High Development Scenario 80:20)**

Lot	NRCS Method	City of Saskatoon Formula	Design Value
H	120.0	103.6	120.0
F	93.2	69.9	93.2
G	93.2	69.9	93.2
J	94.2	58.6	94.2
L	100.0	75.1	100.0
M	100.0	75.1	100.0
N	100.0	75.1	100.0
P	100.0	75.1	100.0
<b>Total Runoff Volume (Post-development) from the Site</b>			<b>800.4</b>

\* Lot J is already developed (existing building and gravel pavement). It is assumed that no further development will take place at that lot.

## UPDATED PLAN SETUP

Post-development runoff contaminate will take place at two municipal utility ponds (MU1 and MU2). Each pond has the capacity to detain post-development runoff resulting from a 1:100 year event for respective lots:

- West Municipal Utility Pond (MU1): MU1 is located along portion of the west property line which will be serving Lots F, G, H and J for a maximum storage capacity of 371 m<sup>3</sup> (measured from the invert of the outflow culvert). Overflow from MU1 will be discharged to the west ditch. MU1 has the following dimensions 90.0 m (length) x 10.0 m (width) x 1.2 m (depth). The pond's full-service water depth (FSD) is 0.6 m with minimum side slopes of 3:1 to reduce erosion. The maximum FSD is 0.9 m up to the invert of the outflow culvert.
- South Municipal Utility Pond (MU2): MU2 is located along the south property line which will be serving the remaining lots, i.e. Lots L, M, N and P for a maximum storage capacity of 458 m<sup>3</sup> (measured from the invert of the outflow culvert). Overflow from MU2 will be discharged to the west ditch. MU2 has the following dimensions 110.0 m (length) x 10.0 m (width) x 1.2 m (depth). Similar

to MU1, MU2 FSD is 0.6 m with minimum side slopes of 3:1 to reduce erosion and maximum FSD is 0.9 m up to the invert of the outflow culvert.

- **Ponds Sizing:** the ponds were designed with extended storage volumes beyond the required design volumes. The ponds' maximum storage capacities (measured from the invert of the outflow culvert) are as follow: MU1 is 371 m<sup>3</sup> and MU2 is 458 m<sup>3</sup> with a total maximum capacity of 829.0 m<sup>3</sup>, which is 259.2 m<sup>3</sup> higher than the required total volume of 569.8 m<sup>3</sup>, i.e. 45.5% more than the estimated post-development runoff volume. The maximum ponds capacities exceed the required storage for the high development scenario (80:20) by approximately 29 m<sup>3</sup>.
- **Extended Freeboard:** Stormwater ponds typically are designed with a 0.30 m (1 foot) of freeboard. Our conservative design calls for a 0.60 m of freeboard as a second line of defense against severe runoff volumes beyond the 1:100 year event. This makes the ultimate storage capacity of both ponds approximately 1,330 m<sup>3</sup> (measured from the crown of the outflow culverts).
- 15 m north and west easement strips.
- A 200-300 mm Corrugated Steel Pipe (CSP) overflow culvert will be installed at each pond to drain excessive runoff (beyond the 1:100 year volumes) towards respective drainage ditch.
- Each lot to be landscaped with a minimum slope of 0.5-1.0% towards prospective pond, i.e. MU1 or MU2.

Figures 3 (Appendix A) shows the proposed updated plan layout.

Yours Sincerely,  
**PINTER & Associates Ltd.**



Ibrahim El-Baroudy, Ph.D., M.Sc., P.Eng.  
Project Senior Hydrogeologist

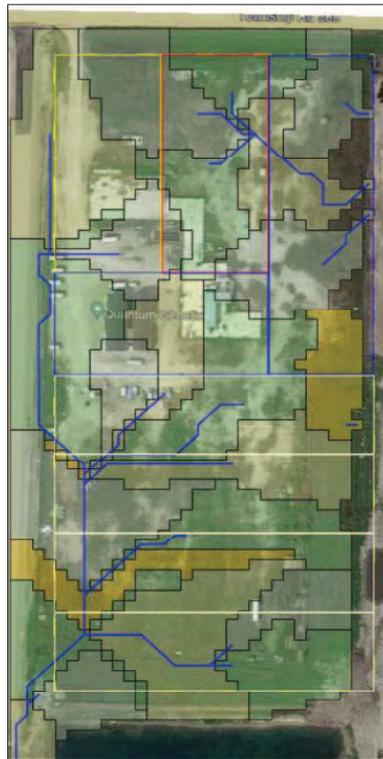
# **Appendix A**

## **Figures**

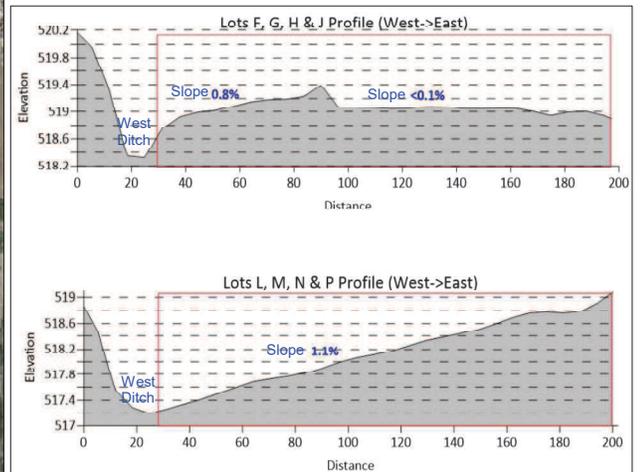




**Contour Map  
& Pre-development Surface Runoff**



**Natural Drainage Paths  
& Discharge Points**



**Selected Site Profiles**



710A-48TH STREET EAST  
SASKATOON, SK S7K 5B4  
306.244.1710  
pintermain@pinter.ca

**Notes:**

1. THIS DRAWING IS PREPARED FOR ILLUSTRATIVE PURPOSES ONLY.

**Legend:**

Project Boundaries

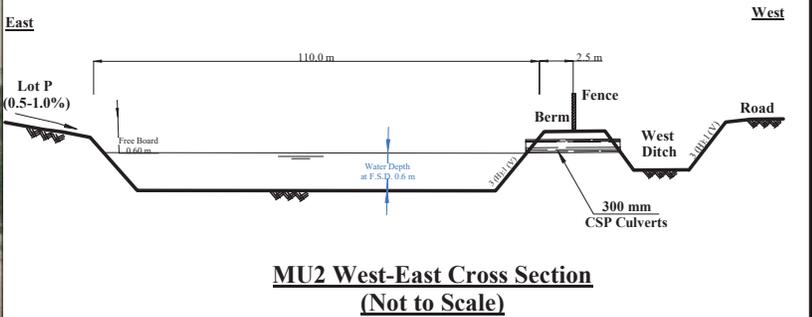
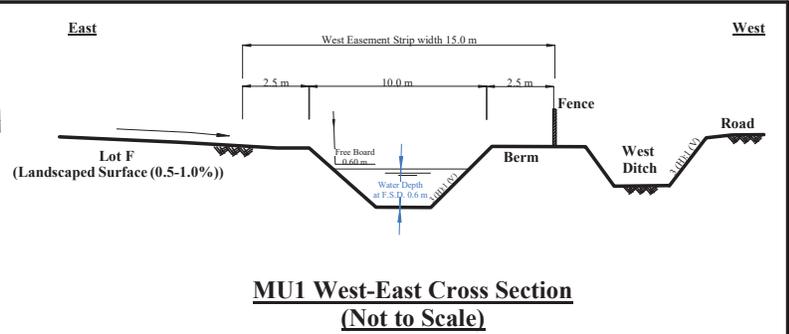


**Figure 2  
LOCAL HYDROLOGY**

16 MARCH 2022  
LAND DEVELOPMENT AT NE-35-35-04-W3M, RM OF CORMAN PARK NO. 344, SK

DRAWN BY: IE

CHECKED BY: DH



710A-48TH STREET EAST  
SASKATOON, SK S7K 5B4  
306.244.1710  
pintermain@pinter.ca

**Notes:**

1. THIS DRAWING IS PREPARED FOR ILLUSTRATIVE PURPOSES ONLY.

**Legend:**

Municipal Pond



**Figure 3**

POST-DEVELOPMENT UPDATED DRAINAGE PLAN

13 OCTOBER 2022

LAND DEVELOPMENT AT NE-35-35-04-W3M, RM OF CORMAN PARK NO. 344, SK

DRAWN BY: IE

CHECKED BY: DH

**Appendix B**  
**Selected Site Photographs**



Photograph #1: Looking northeast at the west ditch.



Photograph #2: Looking east at the soil stockpile stored at the Site.



Photograph #3: Looking east at the north ditch.



Photograph #4: Looking south at the soil stockpile and slough at Lot H.



Photograph #5: Survey crew close to the northeast corner of the Site.



Photograph #6: Looking west at the north ditch showing its slope towards the west.



Photograph #7: Looking south at the west ditch showing its slope towards the south.



Photograph #8: Looking northeast at the south portion of the Site. Shallow west ditch causes flooding at the southwest corner of the Site.

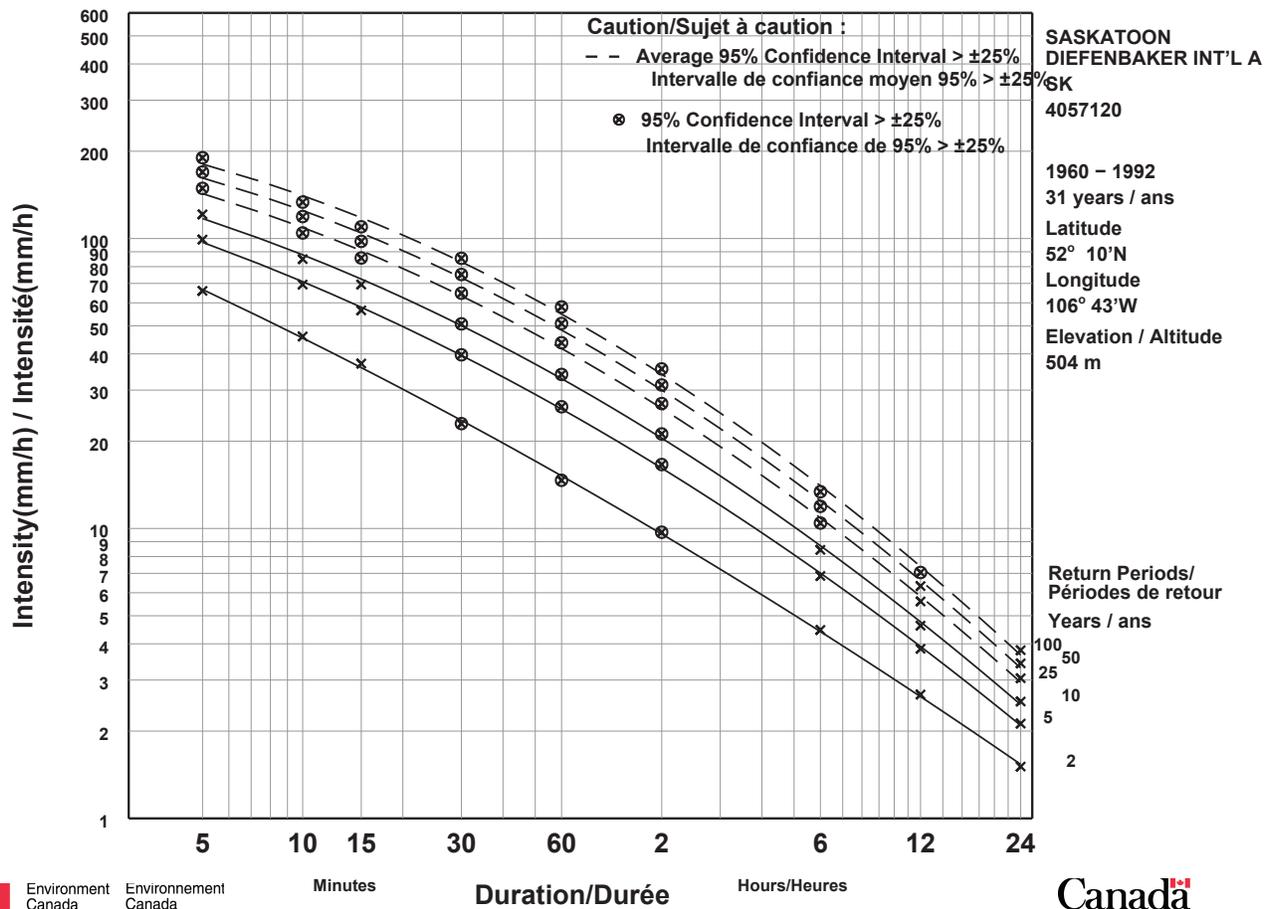
## **Appendix C**

### **Hydrogeological Data & Calculations**

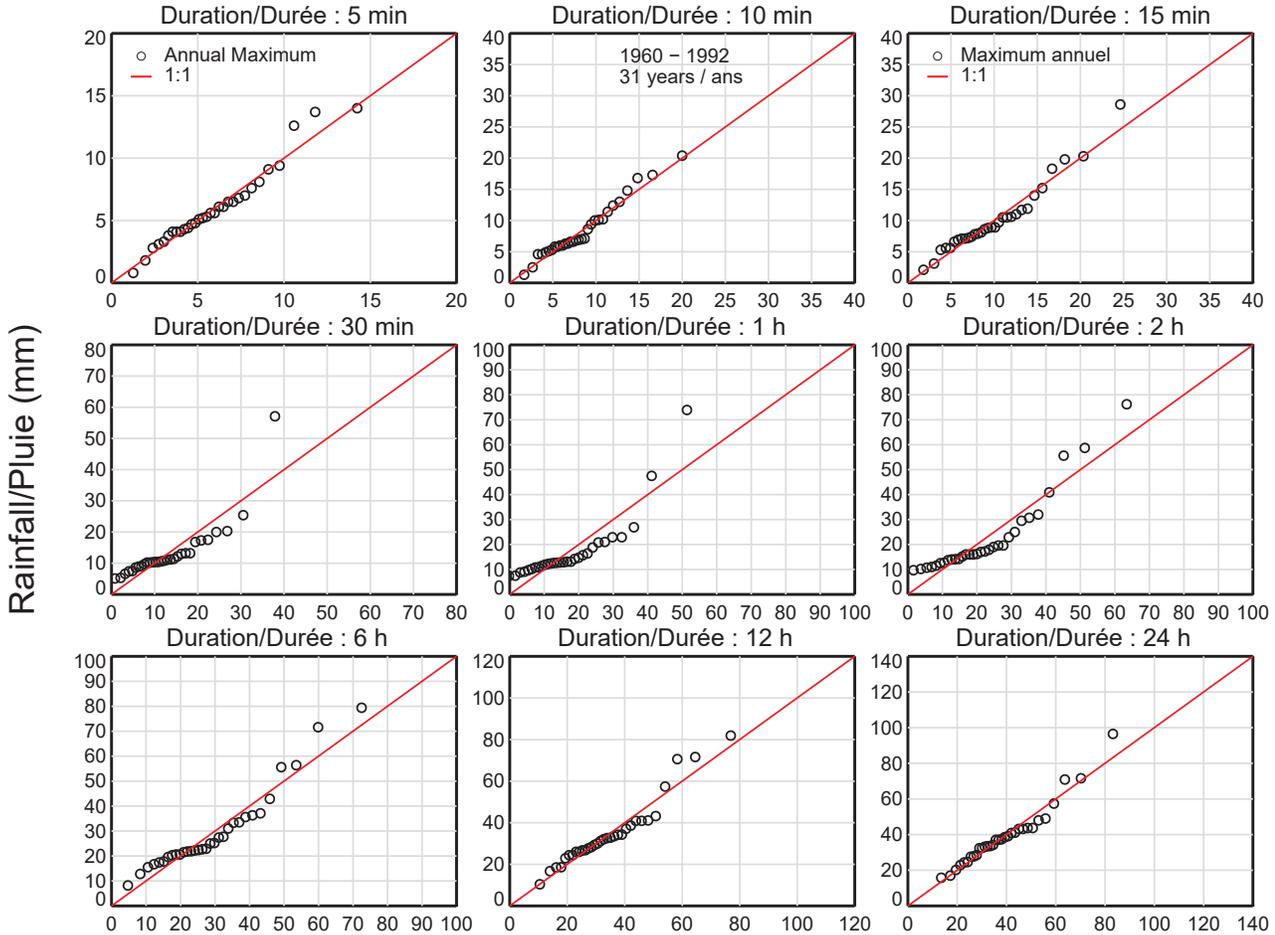
# Short Duration Rainfall Intensity–Duration–Frequency Data

2014/12/21

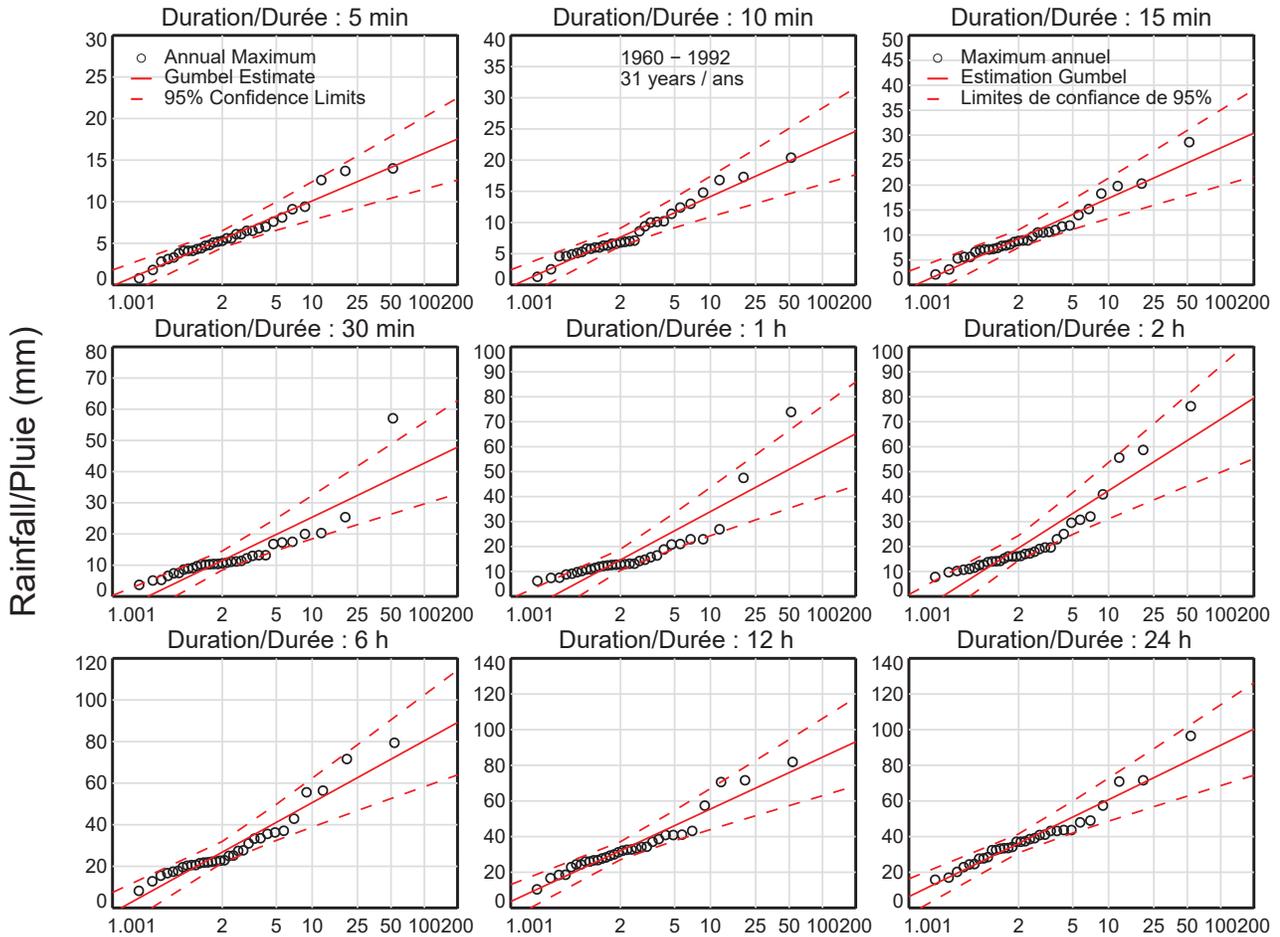
## Données sur l'intensité, la durée et la fréquence des chutes de pluie de courte durée



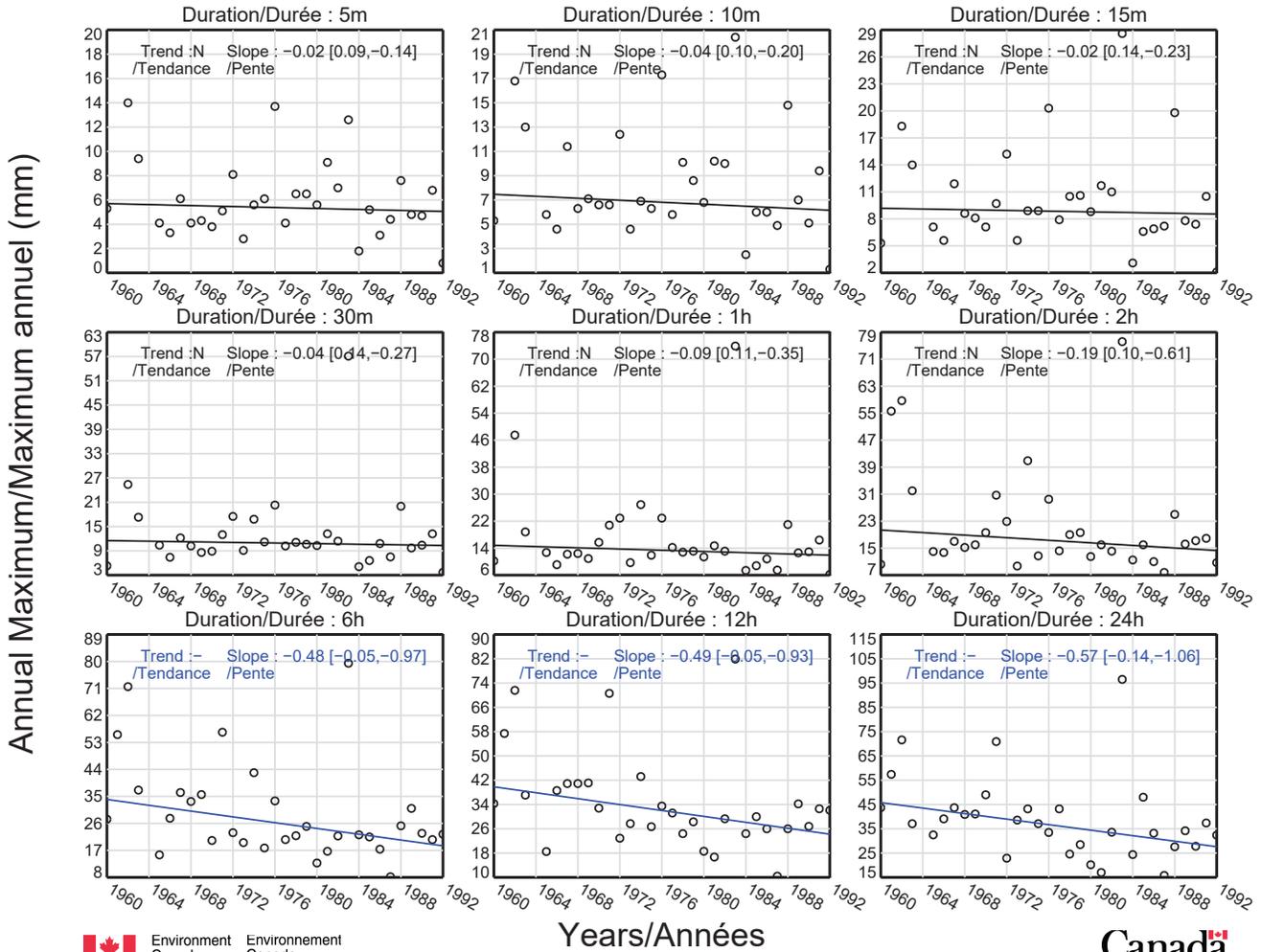
Quantile-Quantile : SASKATOON DIEFENBAKER INT'L A, SK 4057120



Return Level/Niveau de retour : SASKATOON DIEFENBAKER INT'L A, SK 4057120



Trend/Tendance : SASKATOON DIEFENBAKER INT'L A, SK 4057120



Environment Canada/Environnement Canada

Short Duration Rainfall Intensity-Duration-Frequency Data  
Données sur l'intensité, la durée et la fréquence des chutes  
de pluie de courte durée

Gumbel - Method of moments/Méthode des moments

2014/12/21

=====  
SASKATOON DIEFENBAKER INT'L A SK 4057120  
Latitude: 52 10'N Longitude: 106 43'W Elevation/Altitude: 504 m  
Years/Années : 1960 - 1992 # Years/Années : 31  
=====

\*\*\*\*\*

Table 1 : Annual Maximum (mm)/Maximum annuel (mm)

\*\*\*\*\*

Year Année	5 min	10 min	15 min	30 min	1 h	2 h	6 h	12 h	24 h
1960	5.3	5.3	5.3	5.3	10.2	10.2	27.4	34.3	43.7
1961	-99.9	-99.9	-99.9	-99.9	-99.9	55.6	55.6	57.4	57.4

1962	14.0	16.8	18.3	25.4	47.5	58.7	71.6	71.6	71.6
1963	9.4	13.0	14.0	17.3	18.8	32.0	37.1	37.1	37.1
1965	4.1	5.8	7.1	10.4	12.7	14.0	15.5	18.5	32.5
1966	3.3	4.6	5.6	7.4	9.1	13.7	27.7	38.6	39.1
1967	6.1	11.4	11.9	12.2	12.2	17.0	36.3	40.9	43.7
1968	4.1	6.3	8.6	10.2	12.4	15.2	33.3	40.9	40.9
1969	4.3	7.1	8.1	8.6	10.9	16.0	35.6	41.1	41.1
1970	3.8	6.6	7.1	8.9	15.7	19.6	20.3	32.8	49.0
1971	5.1	6.6	9.7	13.0	20.8	30.7	56.4	70.6	70.9
1972	8.1	12.4	15.2	17.5	22.9	22.9	22.9	22.9	22.9
1973	2.8	4.6	5.6	9.1	9.7	9.7	19.6	27.7	38.6
1974	5.6	6.9	8.9	16.8	26.9	40.9	42.9	43.2	43.2
1975	6.1	6.3	8.9	11.2	11.9	12.7	17.8	26.7	37.1
1976	13.7	17.3	20.3	20.3	22.9	29.5	33.5	33.5	33.5
1977	4.1	5.8	7.9	10.2	14.2	14.2	20.6	31.2	43.2
1978	6.5	10.1	10.5	11.1	12.8	19.0	21.9	24.4	24.6
1979	6.5	8.6	10.6	10.6	13.1	19.6	25.0	28.3	28.5
1980	5.6	6.8	8.8	10.3	11.4	12.5	12.8	18.6	20.2
1981	9.1	10.2	11.7	13.2	14.7	16.0	16.7	16.7	17.0
1982	7.0	10.0	11.0	11.4	13.1	14.1	21.8	29.3	33.6
1983	12.6	20.4	28.6	57.1	73.9	76.2	79.4	81.9	96.5
1984	1.8	2.5	3.1	5.1	7.4	11.5	22.2	24.4	24.4
1985	5.2	6.0	6.6	6.6	8.8	16.0	21.5	30.0	48.0
1986	3.1	6.0	6.9	10.8	10.8	11.0	17.4	26.0	33.2
1987	4.4	4.9	7.2	7.5	7.5	7.8	8.2	10.4	15.8
1988	7.6	14.8	19.8	20.0	21.0	25.0	25.2	26.0	27.6
1989	4.8	7.0	7.8	9.7	12.6	16.2	31.0	34.2	34.2
1990	4.7	5.1	7.4	10.4	12.9	17.2	22.7	26.8	27.8
1991	6.8	9.4	10.5	13.2	16.4	17.9	20.6	32.6	37.4
1992	.8	1.3	2.1	3.7	6.2	10.7	22.4	32.1	32.4

	31	31	31	31	31	32	32	32	32
# Yrs. Années	31	31	31	31	31	32	32	32	32
Mean Moyenne	6.0	8.4	10.2	13.0	16.8	22.0	29.5	34.7	39.0
Std. Dev. Écart-type	3.1	4.4	5.5	9.5	13.2	15.6	16.2	15.9	16.7
Skew. Dissymétrie	1.15	1.09	1.61	3.60	3.30	2.17	1.71	1.53	1.64
Kurtosis	4.54	4.07	6.38	18.80	15.23	7.67	5.94	5.58	6.92

\*-99.9 Indicates Missing Data/Données manquantes

Warning: annual maximum amount greater than 100-yr return period amount  
 Avertissement : la quantité maximale annuelle excède la quantité  
 pour une période de retour de 100 ans

Year/Année	Duration/Durée	Data/Données	100-yr/ans
1983	15 min	28.6	27.4
1983	30 min	57.1	42.7
1983	1 h	73.9	58.1
1983	2 h	76.2	71.0
1983	24 h	96.5	91.3

\*\*\*\*\*

Table 2a : Return Period Rainfall Amounts (mm)  
 Quantité de pluie (mm) par période de retour

\*\*\*\*\*

Duration/Durée	2	5	10	25	50	100	#Years
	yr/ans	yr/ans	yr/ans	yr/ans	yr/ans	yr/ans	Années
5 min	5.5	8.3	10.1	12.4	14.1	15.8	31
10 min	7.7	11.6	14.2	17.4	19.8	22.3	31
15 min	9.3	14.1	17.3	21.4	24.4	27.4	31
30 min	11.5	19.9	25.4	32.4	37.6	42.7	31
1 h	14.7	26.3	34.0	43.7	50.9	58.1	31
2 h	19.4	33.2	42.4	53.9	62.5	71.0	32
6 h	26.8	41.1	50.6	62.6	71.5	80.4	32
12 h	32.1	46.2	55.5	67.2	75.9	84.6	32
24 h	36.2	51.0	60.7	73.1	82.2	91.3	32

\*\*\*\*\*

Table 2b :

Return Period Rainfall Rates (mm/h) - 95% Confidence limits  
 Intensité de la pluie (mm/h) par période de retour - Limites de confiance de 95%

\*\*\*\*\*

Duration/Durée	2	5	10	25	50	100	#Years
	yr/ans	yr/ans	yr/ans	yr/ans	yr/ans	yr/ans	Années
5 min	66.0	99.2	121.2	149.0	169.6	190.0	31
	+/- 12.1	+/- 20.5	+/- 27.6	+/- 37.2	+/- 44.6	+/- 51.9	31
10 min	45.9	69.4	84.9	104.5	119.1	133.5	31
	+/- 8.6	+/- 14.4	+/- 19.5	+/- 26.3	+/- 31.5	+/- 36.6	31
15 min	37.0	56.5	69.4	85.7	97.8	109.7	31
	+/- 7.1	+/- 12.0	+/- 16.2	+/- 21.8	+/- 26.1	+/- 30.4	31
30 min	23.0	39.7	50.8	64.8	75.1	85.4	31

	+/-	6.1	+/-	10.3	+/-	13.9	+/-	18.7	+/-	22.4	+/-	26.1	31
1 h		14.7		26.3		34.0		43.7		50.9		58.1	31
	+/-	4.3	+/-	7.2	+/-	9.7	+/-	13.0	+/-	15.6	+/-	18.2	31
2 h		9.7		16.6		21.2		27.0		31.2		35.5	32
	+/-	2.5	+/-	4.2	+/-	5.7	+/-	7.6	+/-	9.1	+/-	10.6	32
6 h		4.5		6.9		8.4		10.4		11.9		13.4	32
	+/-	0.9	+/-	1.4	+/-	2.0	+/-	2.6	+/-	3.2	+/-	3.7	32
12 h		2.7		3.8		4.6		5.6		6.3		7.0	32
	+/-	0.4	+/-	0.7	+/-	1.0	+/-	1.3	+/-	1.5	+/-	1.8	32
24 h		1.5		2.1		2.5		3.0		3.4		3.8	32
	+/-	0.2	+/-	0.4	+/-	0.5	+/-	0.7	+/-	0.8	+/-	0.9	32

\*\*\*\*\*

Table 3 : Interpolation Equation / Équation d'interpolation:  $R = A \cdot T^B$

R = Interpolated Rainfall rate (mm/h)/Intensité interpolée de la pluie (mm/h)

RR = Rainfall rate (mm/h) / Intensité de la pluie (mm/h)

T = Rainfall duration (h) / Durée de la pluie (h)

\*\*\*\*\*

Statistics/Statistiques	2	5	10	25	50	100
	yr/ans	yr/ans	yr/ans	yr/ans	yr/ans	yr/ans
Mean of RR/Moyenne de RR	22.8	35.6	44.1	54.9	62.8	70.7
Std. Dev. /Écart-type (RR)	22.5	33.6	41.0	50.4	57.4	64.4
Std. Error/Erreur-type	3.1	8.4	12.0	16.6	20.0	23.4
Coefficient (A)	14.1	22.1	27.4	34.1	39.0	43.9
Exponent/Exposant (B)	-0.667	-0.680	-0.684	-0.688	-0.690	-0.692
Mean % Error/% erreur moyenne	5.5	11.5	13.8	15.7	16.6	17.4





**Table 2-1** Runoff Drainage Calculation & Stormwater Measurement Device for the Parcel B, Rec'd Plan No. 985W 2097 & Parcel C, Plan No. 10232641, RM of Coon Park No. 314, CV-35-3546.W2M

Category	Area (m <sup>2</sup> )	Runoff Coefficient	Volume (m <sup>3</sup> )	Volume (L)	Volume (m <sup>3</sup> )
Building/Impervious	1,200	0.90	1,080	108,000	108
Gravel Area	1,200	0.15	180	18,000	1.8
Permeable Area	1,200	0.10	120	12,000	1.2
<b>Total Area</b>	<b>3,600</b>		<b>1,380</b>	<b>138,000</b>	<b>139.8</b>

**Table 2-2a** Return Period Rainfall Amounts (mm) / Quantité de pluie (mm) par période de retour

Duration/Durée	2 yr/ans	5 yr/ans	10 yr/ans	25 yr/ans	50 yr/ans	100 yr/ans
5 min	5.5	8.3	10.1	12.4	14.1	15.8
10 min	7.7	11.6	14.2	17.4	19.8	22.3
15 min	9.3	14.1	17.3	21.4	24.4	27.4
30 min	11.5	19.9	25.4	32.4	37.6	42.7
1 h	14.7	26.3	34.0	43.7	50.9	58.1
2 h	19.4	33.2	42.4	53.9	62.5	71.0
6 h	26.8	41.1	50.6	62.6	71.5	80.4
12 h	32.1	46.2	55.5	67.2	75.9	84.6
24 h	36.2	51.0	60.7	73.1	82.2	91.3

**Table 2-2b** Runoff curve numbers for urban areas<sup>1</sup>

Cover type and hydrologic condition	Average percent impervious area <sup>2</sup>	Curve numbers for hydrologic soil group			
		A	B	C	D
<b>Fully developed urban areas (vegetation established)</b>					
Open space (lawns, parks, golf courses, cemeteries, etc.) <sup>3</sup> :					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	60	70	84
Good condition (grass cover > 75%)		39	61	74	80
<b>Impervious areas:</b>					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
<b>Streets and roads:</b>					
Paved, curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved, open ditches (including right-of-way)		83	80	92	93
Gravel (including right-of-way)		76	85	88	91
Dirt (including right-of-way)		72	82	87	89
<b>Western desert urban areas:</b>					
Natural desert landscaping (pervious areas only) <sup>4</sup>		63	77	85	88
Artificial desert landscaping (pervious areas only, desert shrubs with 1- to 3-inch sand or gravel mulch and basin borders)		96	96	96	96
<b>Urban districts:</b>					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (town houses)	65	77	85	90	92
1/4 acre	58	61	75	83	87
1/2 acre	39	57	72	81	86
1 acre	25	54	70	80	85
2 acres	12	46	65	77	82
<b>Developing urban areas</b>					
Newly graded areas (pervious areas only, no vegetation) <sup>5</sup>		77	86	91	94

<sup>1</sup> Average runoff condition, and  $I_p = 0.25$   
<sup>2</sup> The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.  
<sup>3</sup> CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.  
<sup>4</sup> Composite CN's for natural desert landscaping should be computed using figure 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrubs in poor hydrologic condition.  
<sup>5</sup> Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.





**Table 2-1** Runoff Drainage Calculation & Stormwater Measurement Design for the Parcel B, Rec'd Plan No. 9850V 20227 & Parcel C, Plan No. 10232641, RM of Coon Park No. 314, CV-35-35-61-W2M1

**Site** L. M. S. P.

**1. Weighted Average Curve Number Technique**

Impervious	Area (ac)	Curve Number	Weighted Curve Number	Area (ac)	Curve Number	Area (ac)	Curve Number	Area (ac)	Curve Number
Building/Sealed Area	0.0	0.00		0.0	0.00	0.0	0.00	0.0	0.00
Asphalt/Concrete	0.0	0.00		0.0	0.00	0.0	0.00	0.0	0.00
Gravel	0.0	0.00		0.0	0.00	0.0	0.00	0.0	0.00
Other	0.0	0.00		0.0	0.00	0.0	0.00	0.0	0.00
<b>Total Area(s)</b>	<b>0.0</b>	<b>0.00</b>		<b>0.0</b>	<b>0.00</b>	<b>0.0</b>	<b>0.00</b>	<b>0.0</b>	<b>0.00</b>
<b>Total Area (Acres)</b>	<b>0.0</b>	<b>0.00</b>		<b>0.0</b>	<b>0.00</b>	<b>0.0</b>	<b>0.00</b>	<b>0.0</b>	<b>0.00</b>

**3. Weighted Average Values Technique**

Impervious	Area (ac)	Curve Number	Weighted Curve Number	Area (ac)	Curve Number	Area (ac)	Curve Number	Area (ac)	Curve Number
Building/Sealed Area	0.0	0.00		0.0	0.00	0.0	0.00	0.0	0.00
Asphalt/Concrete	0.0	0.00		0.0	0.00	0.0	0.00	0.0	0.00
Gravel	0.0	0.00		0.0	0.00	0.0	0.00	0.0	0.00
Other	0.0	0.00		0.0	0.00	0.0	0.00	0.0	0.00
<b>Total Area(s)</b>	<b>0.0</b>	<b>0.00</b>		<b>0.0</b>	<b>0.00</b>	<b>0.0</b>	<b>0.00</b>	<b>0.0</b>	<b>0.00</b>
<b>Total Area (Acres)</b>	<b>0.0</b>	<b>0.00</b>		<b>0.0</b>	<b>0.00</b>	<b>0.0</b>	<b>0.00</b>	<b>0.0</b>	<b>0.00</b>

**Table 2a : Return Period Rainfall Amounts (mm)**  
Quantité de pluie (mm) par période de retour

Duration/Durée	2	5	10	25	50	100	#Years
	yr/ans	yr/ans	yr/ans	yr/ans	yr/ans	yr/ans	Années
5 min	5.5	8.3	10.1	12.4	14.1	15.8	31
10 min	7.7	11.6	14.2	17.4	19.8	22.3	31
15 min	9.3	14.1	17.3	21.4	24.4	27.4	31
30 min	11.5	19.9	25.4	32.4	37.6	42.7	31
1 h	14.7	26.3	34.0	43.7	50.9	58.1	31
2 h	19.4	33.2	42.4	53.9	62.5	71.0	32
6 h	26.8	41.1	50.6	62.6	71.5	80.4	32
12 h	32.1	46.2	55.5	67.2	75.9	84.6	32
24 h	36.2	51.0	60.7	73.1	82.2	91.3	32

**Table 2-2a** Runoff curve numbers for urban areas<sup>1</sup>

Cover description	Average percent impervious area <sup>2</sup>	Curve numbers for hydrologic soil group			
		A	B	C	D
<b>Fully developed urban areas (vegetation established)</b>					
Open space (lawns, parks, golf courses, cemeteries, etc.) <sup>3</sup> :					
Poor condition (grass cover < 50%)		68	70	86	88
Fair condition (grass cover 50 to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
<b>Impervious areas:</b>					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved, curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved, open ditches (including right-of-way)		83	80	92	93
Gravel (including right-of-way)		76	85	88	91
Dirt (including right-of-way)		72	82	87	89
<b>Western desert urban areas:</b>					
Natural desert landscaping (pervious areas only) <sup>4</sup>		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrubs with 1- to 3-inch sand or gravel mulch and basin borders)		96	96	96	96
<b>Urban districts:</b>					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
<b>Residential districts by average lot size:</b>					
1/8 acre or less (town houses)	65	77	85	90	92
1/4 acre	58	61	75	83	87
1/2 acre	55	57	72	81	86
1 acre	50	54	70	80	85
2 acres	42	46	65	77	82
<b>Developing urban areas</b>					
Newly graded areas (pervious areas only, no vegetation) <sup>5</sup>		77	86	91	94

<sup>1</sup> Average runoff condition, and  $I_p = 0.25$ .

<sup>2</sup> The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.

<sup>3</sup> CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.

<sup>4</sup> Composite CN's for natural desert landscaping should be computed using figure 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrubs in poor hydrologic condition.

<sup>5</sup> Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.

**ESB-3** Runoff Drainage Calculations & Stormwater Management Design for the Parcel B, Reg's Plan No. 98MW20997 & Parcel C, Plan No. 102236431, RM of Cooran Park No. 344, (NE-35-35-84-W3M)

Runoff	F, G, J							
Runoff Method	Rational Method							
Step 1: Time of Concentration	$T_c = \frac{0.007 (nL)^{0.8}}{[(P_2)^{0.5} - 5.0A]}$							
Runoff	Area (ac <sup>2</sup> )	Area Runoff Coeff	Runoff Coeff	Weighted Average Runoff Coeff	Run Length (ft)	Runoff Coeff <sup>2</sup> 2 Year - 10% (mm)	Step of hydrologic peak (ft) (ft) or (mm)	Time of Conc. (min)
Building/Sealed Area	810	0.100	0.011	0.122	131,234	1,425	0.005	27.0
Impervious Land Cover	810	0.100	0.011					
Gravel Area	810	0.100	0.011					
Permeable Land Cover	810	0.100	0.011					
Undeveloped Area	4,000	0.200	0.150					
Total Area (ac <sup>2</sup> )	8,100	1.000			40,000	36,200		
Total Area (Acres)	2,862	1.000						

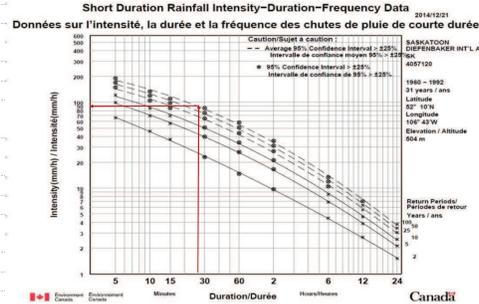
**Q = 0.0028 CiA (S.I. units)**

Runoff	Area (ac <sup>2</sup> )	Area (ha)	Area Runoff Coeff	Runoff Coeff	Weighted Average Runoff Coeff	1118 Year Runoff Intensity (mm/hr)	Peak Runoff (l/s)
Building/Sealed Area	810	0.811	0.100	0.05	0.123	90.00	0.64
Impervious Land Cover	810	0.811	0.100	0.05			
Gravel Area	810	0.811	0.100	0.05			
Permeable Land Cover	810	0.811	0.100	0.05			
Undeveloped Area	4,000	4,000	0.200	0.16			
Total Area (ac <sup>2</sup> )	8,100	8,100	1.000				
Total Area (Acres)	2,862	7,000					

**Table B-1** Roughness coefficients for sheet flow (flow depth generally < 0.1 feet)

Surface description	n <sup>1</sup>
Smooth surface (concrete, asphalt, gravel, or bare soil)	0.011
Fallow (no residue)	0.05
Cultivated soils	
Residue cover < 20%	0.06
Residue cover > 20%	0.17
Grass	
Short grass prairie	0.15
Dense grasses <sup>2</sup>	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woods <sup>3</sup>	
Light underbrush	0.40
Dense underbrush	0.80

- The n values are a composite of information compiled by Engman (1990)
- Includes species such as weeping lovegrass, bluegrass, buffalograss, blue gramma grass, and native grass mixtures
- When selecting n, consider cover to a height of about 0.1 ft. This is the only part of the plant cover that will obstruct sheet flow.



**Table B-2** Runoff Coefficients for Urban Areas

Land Use	C (2 year)
Single family residential <sup>1</sup>	0.30
Multi-unit residential, industrial and commercial <sup>2</sup>	0.60
Parks, cemeteries, playgrounds, landscaped areas (lawns, gravel, etc.)	0.10
Unimproved & undeveloped	0.05
Streets, sidewalks, parking lots	Asphalt, concrete, brick, etc. 0.95 Gravel (compacted) 0.50
Roofs	0.95

Flow (l/s)	25.65	Flow (ac <sup>2</sup> )	0.021
A <sup>3</sup>	6.53		
K	824		
B	-204.375		
Volume (m <sup>3</sup> /hr)	88.55	Volume (ac <sup>2</sup> )	45.25



**Table 2-1** Runoff Drainage Calculation & Stormwater Management Design for the Parcel B, Rec'd Plan No. 985W 20997 & Parcel C, Plan No. 10232461, RM of Coonam Park No. 314, CV-35-35-64-W2M1

**Table 2-1a** 1. Weighted Average Curve Number Technique

Impervious	Area (m <sup>2</sup> )	Curve Number	Weighted Curve Number
Building/Impervious	100	100	100
Gravel Area	100	60	60
Asphalt Area	100	80	80
Grass Area	100	40	40
<b>Total Area (m<sup>2</sup>)</b>	<b>400</b>		
<b>Total Area (Acres)</b>	<b>1.001</b>		

**Table 2-1b** 2. Weighted Average Velocity Technique

Impervious	Area (m <sup>2</sup> )	Velocity (m/s)	Weighted Velocity
Building/Impervious	100	1.0	100
Gravel Area	100	0.5	50
Asphalt Area	100	0.8	80
Grass Area	100	0.3	30
<b>Total Area (m<sup>2</sup>)</b>	<b>400</b>		
<b>Total Area (Acres)</b>	<b>1.001</b>		

**Table 2a : Return Period Rainfall Amounts (mm)**  
Quantité de pluie (mm) par période de retour

Duration/Durée	2 yr/ans	5 yr/ans	10 yr/ans	25 yr/ans	50 yr/ans	100 yr/ans	#Years/Années
5 min	5.5	8.3	10.1	12.4	14.1	15.8	31
10 min	7.7	11.6	14.2	17.4	19.8	22.3	31
15 min	9.3	14.1	17.3	21.4	24.4	27.4	31
30 min	11.5	19.9	25.4	32.4	37.6	42.7	31
1 h	14.7	26.3	34.0	43.7	50.9	58.1	31
2 h	19.4	33.2	42.4	53.9	62.5	71.0	32
6 h	26.8	41.1	50.6	62.6	71.5	80.4	32
12 h	32.1	46.2	55.5	67.2	75.9	84.6	32
24 h	36.2	51.0	60.7	73.1	82.2	91.3	32

**Table 2-2a** Runoff curve numbers for urban areas<sup>1</sup>

Cover type and hydrologic condition	Average percent impervious area <sup>2</sup>	Curve numbers for hydrologic soil group			
		A	B	C	D
<b>Fully developed urban areas (vegetation established)</b>					
<b>Open space (lawns, parks, golf courses, cemeteries, etc.):<sup>3</sup></b>					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	60	70	84
Good condition (grass cover > 75%)		39	61	74	80
<b>Impervious areas:</b>					
<b>Streets and roads</b>					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
<b>Western desert urban areas:</b>					
Natural desert landscaping (pervious areas only) <sup>4</sup>		63	77	85	88
Artificial desert landscaping (pervious weed barrier, desert shrubs with 1- to 3-inch sand or gravel mulch and basin borders)		96	96	96	96
<b>Urban districts:</b>					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
<b>Residential districts by average lot size:</b>					
1/8 acre or less (town houses)	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/2 acre	39	57	72	81	86
1 acre	25	54	70	80	85
2 acres	20	51	68	78	84
4 acres	12	46	65	77	82
<b>Developing urban areas</b>					
<b>Newly graded areas (pervious areas only, no vegetation)<sup>5</sup></b>					
		77	86	91	94

<sup>1</sup> Average runoff condition, and  $I_p = 0.25$ .

<sup>2</sup> The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.

<sup>3</sup> CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.

<sup>4</sup> Composite CN's for natural desert landscaping should be computed using figure 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrubs in poor hydrologic condition.

<sup>5</sup> Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.

Hi Adam,

To answer your question regarding our assumption of developed/undeveloped portions of the lots, I would like to let you know that our design approach for sizing both municipal utility ponds (MU1 and MU2) considered this uncertainty through the following steps:

- **Conservative Runoff Volumes Calculations:** We used a conservative design approach. PINTER used three calculation approaches: (1&2) 2 NRCS calculation methods, and (3) the City of Saskatoon Formula. The largest of the three numbers was selected to estimate the runoff volume from the specific lot.
- We included Lot J's runoff volume (its already developed lot) into the overall post-development runoff volume, representing an additional 13% of the estimated runoff volume.
- **Sizing the pond with additional storage Volume.** The ponds' maximum storage capacities (measured from the invert of the outflow culvert) are as follow: MU1 371 m<sup>3</sup> and 458 m<sup>3</sup> with a total maximum capacity of **829 m<sup>3</sup>**, which is 321 m<sup>3</sup> higher than the required total volume of 508 m<sup>3</sup>, i.e. 63% more than the estimated post-development runoff volume.
- **Extended Freeboard:** Stormwater ponds are typically designed with a 0.30 m (1 foot) of freeboard. Our design has a 0.60 m of freeboard as a second line of defense against severe runoff volumes beyond the 1:100 year event. This makes the ultimate storage capacity of both ponds approximately 1,330 m<sup>3</sup>.

To show how conservative our approach is, the following tables show estimated runoff volumes using an 80% lot development (opposite to the assumed 20%), the required storage volume using the same procedure results in an overall post-development runoff volume **of 799 m<sup>3</sup>, which is 29 m<sup>3</sup> less than the ponds maximum storage capacities of 829 m<sup>3</sup>.**

**Table : Runoff Volumes (m<sup>3</sup>) – 80% Development**

<b>Lot</b>	<b>NRCS Method</b>	<b>City of Saskatoon Formula</b>	<b>Design Value</b>
H	189	95	189
F	71	64	71
G	71	64	71
J	0*	0*	0*
L	117	69	117
M	117	69	117
N	117	69	117
P	117	69	117
<b>Total Runoff Volume (Post-development) from the Site</b>			<b>799</b>

\* Lot J is already developed (existing building and gravel pavement). It is assumed that no further development will take place at that lot.

Example Calculations for Various Development Scenarios

Example for Lot H										
City of Saskatoon (formulas are developed for 1:2 year, while WSA requires 1:100 year additional flow due to development)										
Ratio (Devlp:UnDevlp)	C <sub>d</sub>	C <sub>p</sub>	ΔC	A	B	Runoff Volume (m <sup>3</sup> /ha)	Volume (m <sup>3</sup> )	NRCS Method		
								Volume before Development (m <sup>3</sup> )	Volume after Development (m <sup>3</sup> )	Net Volume (m <sup>3</sup> )
20:80	0.50	0.25	-0.25	769	-494.5	-223	-268	69	79	10
40:60	0.50	0.37	-0.13	769	-494.5	-108	-130	69	128	59
60:40	0.50	0.49	-0.01	769	-494.5	-8	-10	69	156	88
80:20	0.50	0.61	0.11	769	-494.5	79	95	69	189	120

Onsite storage is also mandatory for the parcels having runoff coefficients higher than the design values. The following equation can be used to estimate the required onsite storage volume:

$$\text{Volume (m}^3\text{/ha)} = A \times (C_p - C_d) + B \times (C_p - C_d)^2$$

$$A = 869 - (200 \times C_d), B = 33 - (1055 \times C_d)$$

**Table B-2**  
Runoff Coefficients for Urban Areas

Land Use	C (2 year)	
Single family residential <sup>1</sup>	0.30	
Multi-unit residential, industrial and commercial <sup>2</sup>	0.60	
Parks, cemeteries, playgrounds, landscaped areas (lawns, gravel, etc.)	0.10	
Unimproved & undeveloped	0.05	
Streets, sidewalks, parking lots	Asphalt, concrete, brick, etc.	0.95
	Gravel (compacted)	0.50
Roofs	0.95	

**Table B-2 Notes:**

- The runoff coefficient for single-family residential includes the streets. The C value for single family residential is currently under review.
- Higher runoff coefficients may be applicable for parcels with no requirement for internal storm water management system.



Runoff Drainage Calculation & Stormwater Management Design for the Parcel B, Rec'd Plan No. 985W 20997 & Parcel C, Plan No. 10232641, RM of Coon Park No. 314, CV-35-3546.W2M1										
II										
1. Weighted Average Curve Number Technique										
Impervious	Area (ac)	Runoff Coefficient	Weight	CN	Weighted Curve No.	Area (ac)	Runoff Coefficient	Weight	CN	Weighted Curve No.
Building/Impervious Area	1.200	0.800		98		1.200	0.800		98	
Gravel Area	0.000	0.700	0	81	0.000	0.000	0.700	0	81	0.000
Asphalt/Paved Area	1.200	0.800		98		1.200	0.800		98	
<b>Total Area(s)</b>	<b>2.400</b>	<b>0.800</b>				<b>2.400</b>	<b>0.800</b>			
<b>Total Area (Acres)</b>	<b>2.400</b>	<b>0.800</b>				<b>2.400</b>	<b>0.800</b>			
3. Weighted Average Volume Technique										
Impervious	Area (ac)	Runoff Coefficient	Weight	CN	Weighted Curve No.	Area (ac)	Runoff Coefficient	Weight	CN	Weighted Curve No.
Building/Impervious Area	1.200	0.800		98		1.200	0.800		98	
Gravel Area	0.000	0.700	0	81	0.000	0.000	0.700	0	81	0.000
Asphalt/Paved Area	1.200	0.800		98		1.200	0.800		98	
<b>Total Area(s)</b>	<b>2.400</b>	<b>0.800</b>				<b>2.400</b>	<b>0.800</b>			
<b>Total Area (Acres)</b>	<b>2.400</b>	<b>0.800</b>				<b>2.400</b>	<b>0.800</b>			

Table 2a : Return Period Rainfall Amounts (mm) Quantité de pluie (mm) par période de retour										
Duration/Durée	2 yr/ans	5 yr/ans	10 yr/ans	25 yr/ans	50 yr/ans	100 yr/ans	#Years/Années			
5 min	5.5	8.3	10.1	12.4	14.1	15.8	31			
10 min	7.7	11.6	14.2	17.4	19.8	22.3	31			
15 min	9.3	14.1	17.3	21.4	24.4	27.4	31			
30 min	11.5	19.9	25.4	32.4	37.6	42.7	31			
1 h	14.7	26.3	34.0	43.7	50.9	58.1	31			
2 h	19.4	33.2	42.4	53.9	62.5	71.0	32			
6 h	26.8	41.1	50.6	62.6	71.5	80.4	32			
12 h	32.1	46.2	55.5	67.2	75.9	84.6	32			
24 h	36.2	51.0	60.7	73.1	82.2	91.3	32			

Table 2-2a Runoff curve numbers for urban areas <sup>1</sup>										
Cover type and hydrologic condition	Average percent impervious area <sup>2</sup>	Curve numbers for hydrologic soil group								
		A	B	C	D					
<b>Fully developed urban areas (vegetation established)</b>										
<b>Open space (lawns, parks, golf courses, cemeteries, etc.):<sup>3</sup></b>										
Poor condition (grass cover < 50%)		68	79	86	89					
Fair condition (grass cover 50% to 75%)		49	60	70	84					
Good condition (grass cover > 75%)		39	61	74	80					
<b>Impervious areas:</b>										
<b>Paved parking lots, roofs, driveways, etc. (excluding right-of-way)</b>										
Streets and roads		98	98	98	98					
Paved, curbs and storm sewers (excluding right-of-way)		98	98	98	98					
Paved, open ditches (including right-of-way)		83	80	92	93					
Gravel (including right-of-way)		76	85	88	91					
Dirt (including right-of-way)		72	82	87	89					
<b>Western desert urban areas:</b>										
<b>Natural desert landscaping (pervious areas only)<sup>4</sup></b>										
Artificial desert landscaping (pervious weed barrier, desert shrubs with 1- to 3-inch sand or gravel mulch and basin borders)		63	77	85	88					
<b>Urban districts:</b>										
Commercial and business		85	89	92	94					
Industrial		81	88	91	93					
<b>Residential districts by average lot size:</b>										
1/8 acre or less (town houses)		65	77	85	90					
1/4 acre		58	61	75	83					
1/2 acre		39	57	72	81					
1 acre		25	54	70	80					
2 acres		20	51	68	78					
		12	46	65	77					
<b>Developing urban areas</b>										
<b>Newly graded areas (pervious areas only, no vegetation)<sup>5</sup></b>										
		77	86	91	94					

<sup>1</sup> Average runoff condition, and  $I_p = 0.25$ .

<sup>2</sup> The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.

<sup>3</sup> CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.

<sup>4</sup> Composite CN's for natural desert landscaping should be computed using figures 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrubs in poor hydrologic condition.

<sup>5</sup> Composite CN's to use for the design of temporary measures during grading and construction should be computed using figures 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.

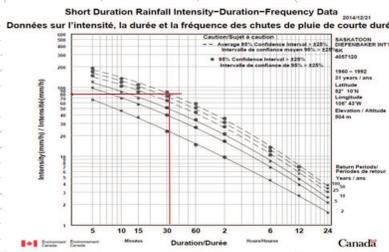


**Table 2-1** Runoff Drainage Calculation & Stormwater Management Design for the Parcel B, Site No. 3330-2027-A Parcel C, Site No. 18126-01, RM of Carleton Place, No. 364-NE-25-32-84-313M

Surface Description	Area (m <sup>2</sup> )	Runoff Coefficient	Runoff Volume (m <sup>3</sup> )	Runoff Coefficient	Runoff Volume (m <sup>3</sup> )	Runoff Coefficient	Runoff Volume (m <sup>3</sup> )
Asphalt	1200	0.95	1140	0.95	1140	0.95	1140
Concrete	1000	0.90	900	0.90	900	0.90	900
Gravel	500	0.70	350	0.70	350	0.70	350
Grass	1000	0.10	100	0.10	100	0.10	100
Soil	1000	0.10	100	0.10	100	0.10	100
<b>Total Area (m<sup>2</sup>)</b>	<b>4700</b>		<b>2690</b>		<b>2690</b>		<b>2690</b>
<b>Total Area (Acres)</b>	<b>1.08</b>						

**Q = 0.0028 CIA (S.I. units)**

Surface Description	Area (m <sup>2</sup> )	Runoff Coefficient	Runoff Volume (m <sup>3</sup> )	Runoff Coefficient	Runoff Volume (m <sup>3</sup> )	Runoff Coefficient	Runoff Volume (m <sup>3</sup> )
Asphalt	1200	0.95	1140	0.95	1140	0.95	1140
Concrete	1000	0.90	900	0.90	900	0.90	900
Gravel	500	0.70	350	0.70	350	0.70	350
Grass	1000	0.10	100	0.10	100	0.10	100
Soil	1000	0.10	100	0.10	100	0.10	100
<b>Total Area (m<sup>2</sup>)</b>	<b>4700</b>		<b>2690</b>		<b>2690</b>		<b>2690</b>
<b>Total Area (Acres)</b>	<b>1.08</b>						



**Table 15-1** Roughness coefficients for sheet flow (flow depth generally ≤ 0.1 feet)

Surface description	n <sup>1</sup>
Smooth surface (concrete, asphalt, gravel, or bare soil)	0.011
Fallow (no residue)	0.05
Cultivated soils	0.06
Residue cover ≤ 20%	0.17
Residue cover > 20%	0.17
Grass	
Short grass prairie	0.15
Dense grasses <sup>2</sup>	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woods <sup>3</sup>	
Light underbrush	0.40
Dense underbrush	0.80

1 The n values are a composite of information compiled by Engman (1986).  
2 Includes species such as weeping lovegrass, bluegrass, buffalograss, blue grama grass, and native grass mixtures.  
3 When selecting n, consider cover to a height of about 0.1 ft. This is the only part of the plant cover that will obstruct sheet flow.

**Table 3-1** Runoff Coefficients for Rational Formula

Type of Drainage Area	Runoff Coefficient, C <sup>1</sup>
Concrete or Asphalt Pavement	0.9 - 0.9
Commercial and Industrial	0.7 - 0.9
Gravel Roadways and Shoulders	0.5 - 0.7
Residential - Urban	0.5 - 0.7
Residential - Suburban	0.3 - 0.5
Undeveloped	0.1 - 0.3
Barns	0.1 - 0.3
Agricultural - Cultivated Fields	0.15 - 0.4
Agricultural - Pastures	0.1 - 0.4
Agricultural - Forested Areas	0.1 - 0.4

For flat slopes or permeable soil, lower values shall be used. For steep slopes or impermeable soil, higher values shall be used. Steep slopes are 0.1 or steeper.  
From Michigan State Administrative Rules R 280.9.

**Table B-2** Runoff Coefficients for Urban Areas

Land Use	C (2 year)
Single family residential <sup>1</sup>	0.30
Multi-unit residential, industrial and commercial <sup>1</sup>	0.60
Parks, cemeteries, playgrounds, landscaped areas (lawns, gravel, etc.)	0.10
Unimproved & undeveloped	0.05
Streets, sidewalks, parking lots	Asphalt, concrete, brick, etc. 0.95
Roofs	Gravel (compacted) 0.50
	0.95

Parameter	Value	Unit
Flow (m <sup>3</sup> )	2690	m <sup>3</sup>
Area (m <sup>2</sup> )	4700	m <sup>2</sup>
Flow (L/s)	738	L/s
Flow (gpm)	100	gpm



**Table 2-1** Runoff Drainage Calculation & Stormwater Measurement Device for the Parcel B, Rec'd, Plan No. 985012097 & Parcel C, Plan No. 10232641, RM of Coon Park No. 314, CV-35-35-61-W2M1

**Lot** **L. M. S. P.**

**1. Weighted Average Curve Number Technique**

Impervious	Area (sq. ft.)	Runoff Coefficient	Curve Number	Area (sq. ft.)	Runoff Coefficient	Curve Number	Area (sq. ft.)	Runoff Coefficient	Curve Number	Area (sq. ft.)	Runoff Coefficient	Curve Number
Building/Sealed Area	874	0.85	98	94	0.85	98	1,304	0.85	98	1,304	0.85	98
Asphalt/Concrete	4,000	0.70	81	4,000	0.70	81	4,000	0.70	81	4,000	0.70	81
Grass/Soil	1,304	0.20	49	1,304	0.20	49	1,304	0.20	49	1,304	0.20	49
<b>Total Area(s)</b>	<b>6,178</b>			<b>6,178</b>			<b>6,178</b>			<b>6,178</b>		
<b>Total Area (Acres)</b>	<b>2.124</b>			<b>2.124</b>			<b>2.124</b>			<b>2.124</b>		

**3. Weighted Average Values Technique**

Impervious Area(s)	Impervious Area (sq. ft.)	Runoff Coefficient	Curve Number	Area (sq. ft.)	Runoff Coefficient	Curve Number	Area (sq. ft.)	Runoff Coefficient	Curve Number	Area (sq. ft.)	Runoff Coefficient	Curve Number
Building/Sealed Area	874	0.85	98	94	0.85	98	1,304	0.85	98	1,304	0.85	98
Asphalt/Concrete	4,000	0.70	81	4,000	0.70	81	4,000	0.70	81	4,000	0.70	81
Grass/Soil	1,304	0.20	49	1,304	0.20	49	1,304	0.20	49	1,304	0.20	49
<b>Total Area(s)</b>	<b>6,178</b>			<b>6,178</b>			<b>6,178</b>			<b>6,178</b>		
<b>Total Area (Acres)</b>	<b>2.124</b>			<b>2.124</b>			<b>2.124</b>			<b>2.124</b>		

**Table 2a : Return Period Rainfall Amounts (mm)**  
Quantité de pluie (mm) par période de retour

Duration/Durée	2 yr/ans	5 yr/ans	10 yr/ans	25 yr/ans	50 yr/ans	100 yr/ans	#Years/Années
5 min	5.5	8.3	10.1	12.4	14.1	15.8	31
10 min	7.7	11.6	14.2	17.4	19.8	22.3	31
15 min	9.3	14.1	17.3	21.4	24.4	27.4	31
30 min	11.5	19.9	25.4	32.4	37.6	42.7	31
1 h	14.7	26.3	34.0	43.7	50.9	58.1	31
2 h	19.4	35.2	42.4	53.9	62.5	71.0	32
6 h	26.8	41.1	50.6	62.6	71.5	80.4	32
12 h	32.1	46.2	55.5	67.2	75.9	84.6	32
24 h	36.2	51.0	60.7	73.1	82.2	91.3	32

**Table 2-2a** Runoff curve numbers for urban areas <sup>1</sup>

Cover description	Average percent impervious area <sup>2</sup>	Curve numbers for hydrologic soil group			
		A	B	C	D
<b>Fully developed urban areas (vegetation established)</b>					
<b>Open space (lawns, parks, golf courses, cemeteries, etc.):<sup>3</sup></b>					
Poor condition (grass cover < 50%)		68	70	86	89
Fair condition (grass cover 50% to 75%)		49	60	79	84
Good condition (grass cover > 75%)		39	61	74	80
<b>Impervious areas:</b>					
<b>Paved parking lots, roofs, driveways, etc. (excluding right-of-way)</b>					
Streets and roads		98	98	98	98
Paved curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved open ditches (including right-of-way)		83	80	92	93
Gravel (including right-of-way)		76	85	88	91
Dirt (including right-of-way)		72	82	87	89
<b>Western desert urban areas:</b>					
<b>Natural desert landscaping (pervious areas only) <sup>4</sup></b>					
Artificial desert landscaping (impervious weed barrier, desert shrubs with 1- to 3-inch sand or gravel mulch and basin borders)		63	77	85	88
<b>Urban districts:</b>					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
<b>Residential districts by average lot size:</b>					
1/8 acre or less (town houses)	65	77	85	90	92
1/4 acre	58	61	75	83	87
1/2 acre	50	57	72	81	86
1 acre	39	54	70	80	85
2 acres	29	51	68	79	84
3 acres	12	46	65	77	82

**Developing urban areas**

<b>Newly graded areas (pervious areas only, no vegetation) <sup>5</sup></b>	77	86	91	94
<b>Idle lands (CN's are determined using cover types similar to those in table 2-2a).</b>				

<sup>1</sup> Average runoff condition, and  $I_p = 0.25$ .

<sup>2</sup> The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.

<sup>3</sup> CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.

<sup>4</sup> Composite CN's for natural desert landscaping should be computed using figure 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrubs in poor hydrologic condition.

<sup>5</sup> Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.

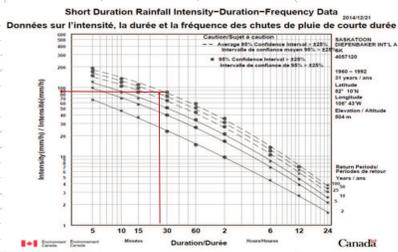
**Table B-1** Runoff Coefficient Calculation & Stormwater Management Design for the Parcel B, Rue 2, Rue No. 8320-2227, A Parcel C, Rue No. 18226-01, RM of Carleton Place, 366 - NE-25-24-3336

Unit: L, M, S, P  
 Rational Method  
 $T_r = \frac{0.007 (a)^{0.58}}{[(P_r)^{0.55} S^{0.64}]}$

Surface	Area (m <sup>2</sup> )	Runoff Coef.	Weighted Runoff Coef. (m <sup>2</sup> )	Area (m <sup>2</sup> )	Runoff Coef.	Weighted Runoff Coef. (m <sup>2</sup> )
Asphalt Paved Area	474	0.95	450	22	0.10	2.2
Concrete Paved Area	4,000	0.95	3,800	220,000	0.10	22,000
Gravel Paved Area	7,500	0.85	6,375	200	0.10	20,000
Grass (m <sup>2</sup> )	8,700	0.10	870	100,000	0.10	10,000
<b>Total Area (m<sup>2</sup>)</b>	<b>21,674</b>		<b>11,545</b>			<b>34,200</b>

**Q = 0.0028 CIA (S.I. units)**

Surface	Area (m <sup>2</sup> )	Runoff Coef.	Weighted Runoff Coef. (m <sup>2</sup> )	Area (m <sup>2</sup> )	Runoff Coef.	Weighted Runoff Coef. (m <sup>2</sup> )
Asphalt Paved Area	474	0.95	450	22	0.10	2.2
Concrete Paved Area	4,000	0.95	3,800	220,000	0.10	22,000
Gravel Paved Area	7,500	0.85	6,375	200	0.10	20,000
Grass (m <sup>2</sup> )	8,700	0.10	870	100,000	0.10	10,000
<b>Total Area (m<sup>2</sup>)</b>	<b>21,674</b>		<b>11,545</b>			<b>34,200</b>



**Table B-2-1** Roughness coefficients for sheet flow (flow depth generally ≤ 0.1 feet)

Surface description	n <sup>1</sup>
Smooth surface (concrete, asphalt, gravel, or bare soil)	0.011
Fallow (no residue)	0.05
Cultivated soils	0.06
Residue cover ≤ 20%	0.17
Residue cover > 20%	0.17
Grass:	
Short grass prairie	0.15
Dense grasses <sup>2</sup>	0.24
Bermudagrass	0.41
Range (natural)	0.13
Wood <sup>3</sup> :	
Light underbrush	0.40
Dense underbrush	0.80

1 The n values are a composite of information compiled by Engman (1986).  
 2 Includes species such as weeping lovegrass, bluegrass, buffalograss, blue grama grass, and native grass mixtures.  
 3 When selecting n, consider cover to a height of about 0.1 ft. This is the only part of the plant cover that will obstruct sheet flow.

**Table B-2** Runoff Coefficients for Urban Areas

Land Use	C (2 year)
Single family residential <sup>1</sup>	0.30
Multi-unit residential, industrial and commercial <sup>2</sup>	0.60
Parks, cemeteries, playgrounds, landscaped areas (lawns, gravel, etc.)	0.10
Unimproved & undeveloped	0.05
Streets, sidewalks, parking lots	0.95
Gravel (compacted)	0.50
Roofs	0.95

**Table B-3-1** Runoff Coefficients for Rational Formula

Type of Drainage Area	Runoff Coefficient, C <sup>1</sup>
Concrete or Asphalt Pavement	0.8 - 0.9
Commercial and Industrial	0.7 - 0.9
Gravel Roadways and Shoulders	0.5 - 0.7
Residential - Urban	0.5 - 0.7
Residential - Suburban	0.3 - 0.5
Undeveloped	0.1 - 0.3
Berms	0.1 - 0.3
Agricultural - Cultivated Fields	0.15 - 0.4
Agricultural - Pastures	0.1 - 0.4
Agricultural - Forested areas	0.1 - 0.4

<sup>1</sup> For flat slopes or permeable soil, lower values shall be used. For steep slopes or impermeable soil, higher values shall be used. Steep slopes are 2:1 or steeper.  
 From Michigan State Administrative Rules R 280.9.

Flow (m <sup>3</sup> /s)	48.97	Flow (m <sup>3</sup> /s)	48.97
Q	0.0028	Q	0.0028
Q	0.0028	Q	0.0028
Volume (m <sup>3</sup> )	96.94	Volume (m <sup>3</sup> )	96.94



**Table 2-1** Runoff Drainage Calculation & Stormwater Measurement Device for the Parcel B, Rec'd Plan No. 985W 2097 & Parcel C, Plan No. 10212641, RM of Coon Park No. 314, CV-35-3546.W2M1

**Table 2-1a** LULU

**2. Weighted Average Curve Number Technique**

Impervious	Area (ac)	Runoff Coefficient	Curve No.	Weighted Curve No.
Building/Impervious	0.00	0.90	98	0.00
Gravel Area	0.00	0.70	81	0.00
Asphalt/Impervious	0.00	0.90	98	0.00
Grass/Impervious	0.00	0.50	63	0.00
<b>Total Area (ac)</b>	<b>0.00</b>	<b>0.00</b>		<b>0.00</b>
<b>Total Area (ac)</b>	<b>0.00</b>	<b>0.00</b>		<b>0.00</b>

**3. Weighted Average Volume Technique**

Impervious	Area (ac)	Runoff Coefficient	Curve No.	Weighted Curve No.
Building/Impervious	0.00	0.90	98	0.00
Gravel Area	0.00	0.70	81	0.00
Asphalt/Impervious	0.00	0.90	98	0.00
Grass/Impervious	0.00	0.50	63	0.00
<b>Total Area (ac)</b>	<b>0.00</b>	<b>0.00</b>		<b>0.00</b>
<b>Total Area (ac)</b>	<b>0.00</b>	<b>0.00</b>		<b>0.00</b>

**Table 2a : Return Period Rainfall Amounts (mm)**  
Quantité de pluie (mm) par période de retour

Duration/Durée	2 yr/ans	5 yr/ans	10 yr/ans	25 yr/ans	50 yr/ans	100 yr/ans	#Years/Années
5 min	5.5	8.3	10.1	12.4	14.1	15.8	31
10 min	7.7	11.6	14.2	17.4	19.8	22.3	31
15 min	9.3	14.1	17.3	21.4	24.4	27.4	31
30 min	11.5	19.9	25.4	32.4	37.6	42.7	31
1 h	14.7	26.3	34.0	43.7	50.9	58.1	31
2 h	19.4	33.2	42.4	53.9	62.5	71.0	32
6 h	26.8	41.1	50.6	62.6	71.5	80.4	32
12 h	32.1	46.2	55.5	67.2	75.9	84.6	32
24 h	36.2	51.0	60.7	73.1	82.2	91.3	32

**Table 2-2a** Runoff curve numbers for urban areas<sup>1</sup>

Cover type and hydrologic condition	Average percent impervious area <sup>2</sup>	Curve numbers for hydrologic soil group			
		A	B	C	D
<b>Fully developed urban areas (vegetation established)</b>					
<b>Open space (lawns, parks, golf courses, cemeteries, etc.):<sup>3</sup></b>					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	60	70	84
Good condition (grass cover > 75%)		39	61	74	80
<b>Impervious areas:</b>					
<b>Streets and roads</b>					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Paved, curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved, open ditches (including right-of-way)		83	80	92	93
Gravel (including right-of-way)		76	85	88	91
Dirt (including right-of-way)		72	82	87	89
<b>Western desert urban areas:</b>					
<b>Natural desert landscaping (pervious areas only)<sup>4</sup></b>					
Artificial desert landscaping (pervious weed barrier, desert shrubs with 1- to 3-inch sand or gravel mulch and basin borders)		63	77	85	88
<b>Urban districts:</b>					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
<b>Residential districts by average lot size:</b>					
1/8 acre or less (town houses)	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/2 acre	39	57	72	81	86
1 acre	25	54	70	80	85
2 acres	20	51	68	78	84
4 acres	12	46	65	77	82
<b>Developing urban areas</b>					
<b>Newly graded areas (pervious areas only, no vegetation)<sup>5</sup></b>					
		77	86	91	94

<sup>1</sup> Average runoff condition, and  $I_a = 0.25$ .

<sup>2</sup> The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.

<sup>3</sup> CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.

<sup>4</sup> Composite CN's for natural desert landscaping should be computed using figure 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrubs in poor hydrologic condition.

<sup>5</sup> Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.





**Table 2-1** Runoff Drainage Calculation & Stormwater Measurement Design for the Parcel B, Rec'd Plan No. 985W 20997 & Parcel C, Plan No. 10232461, RM of Coon Park No. 314, CV-35-35-61-W2M1

**1. Weighted Average Curve Number Technique**

Impervious	Area (ac)	Runoff Coefficient	Curve No.	Weighted Curve No.
Building/Impervious	1.28	0.95	98	95.04
Gravel Area	1.00	0.33	31	31.00
Permeable/Grass	1.00	0.22	49	22.00
<b>Total Area (ac)</b>	<b>3.28</b>			
<b>Total Area (ac)</b>	<b>3.28</b>			

**2. Weighted Average Volume Technique**

Impervious	Area (ac)	Runoff Coefficient	Curve No.	Weighted Curve No.
Building/Impervious	1.28	0.95	98	95.04
Gravel Area	1.00	0.33	31	31.00
Permeable/Grass	1.00	0.22	49	22.00
<b>Total Area (ac)</b>	<b>3.28</b>			
<b>Total Area (ac)</b>	<b>3.28</b>			

**Table 2a : Return Period Rainfall Amounts (mm)**  
Quantité de pluie (mm) par période de retour

Duration/Durée	2 yr/ans	5 yr/ans	10 yr/ans	25 yr/ans	50 yr/ans	100 yr/ans	#Years/Années
5 min	5.5	8.3	10.1	12.4	14.1	15.8	31
10 min	7.7	11.6	14.2	17.4	19.8	22.3	31
15 min	9.3	14.1	17.3	21.4	24.4	27.4	31
30 min	11.5	19.9	25.4	32.4	37.6	42.7	31
1 h	14.7	26.3	34.0	43.7	50.9	58.1	31
2 h	19.4	33.2	42.4	53.9	62.5	71.0	32
6 h	26.8	41.1	50.6	62.6	71.5	80.4	32
12 h	32.1	46.2	55.5	67.2	75.9	84.6	32
24 h	36.2	51.0	60.7	73.1	82.2	91.3	32

**Table 2-2a** Runoff curve numbers for urban areas<sup>1</sup>

Cover type and hydrologic condition	Average percent impervious area <sup>2</sup>	Curve numbers for hydrologic soil group			
		A	B	C	D
<b>Fully developed urban areas (vegetation established)</b>					
<b>Open space (lawns, parks, golf courses, cemeteries, etc.):<sup>3</sup></b>					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	60	70	84
Good condition (grass cover > 75%)		39	61	74	80
<b>Impervious areas:</b>					
<b>Streets and roads</b>					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
<b>Western desert urban areas</b>					
Natural desert landscaping (pervious areas only) <sup>4</sup>		63	77	85	88
Artificial desert landscaping (pervious weed barrier, desert shrubs with 1- to 3-inch sand or gravel mulch and basin borders)		96	96	96	96
<b>Urban districts</b>					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
<b>Residential districts by average lot size:</b>					
1/8 acre or less (town houses)	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/2 acre	39	57	72	81	86
1 acre	25	54	70	80	85
2 acres	20	51	68	78	84
4 acres	12	46	65	77	82
<b>Developing urban areas</b>					
<b>Newly graded areas (pervious areas only, no vegetation)<sup>5</sup></b>					
		77	86	91	94

<sup>1</sup> Average runoff condition, and  $I_p = 0.25$ .

<sup>2</sup> The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.

<sup>3</sup> CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.

<sup>4</sup> Composite CN's for natural desert landscaping should be computed using figure 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrubs in poor hydrologic condition.

<sup>5</sup> Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.

**Table 1-1** Runoff Coefficient Calculation & Stormwater Management Design for the Parcel B, Rev'd Plan No. 2020-2057 & Parcel C, Plan No. 2020-2061, RM of Common Park No. 201, CR-25-25-84-30-350

**Table 1-2** Runoff Coefficient

$$T_r = \frac{0.007 (nI)^{0.8}}{[(F_p)^{0.5} S^{0.5}]}$$

Surface Description	Runoff Coefficient	Area (sq ft)					
Asphalt	0.90	1,200	1,080	0.90	1,200	1,080	0.90
Concrete	0.90	1,200	1,080	0.90	1,200	1,080	0.90
Grass	0.15	1,200	180	0.15	1,200	180	0.15
Gravel	0.30	1,200	360	0.30	1,200	360	0.30
Soil	0.10	1,200	120	0.10	1,200	120	0.10
Wood	0.10	1,200	120	0.10	1,200	120	0.10
Roof	0.90	1,200	1,080	0.90	1,200	1,080	0.90
Other	0.10	1,200	120	0.10	1,200	120	0.10
<b>Total</b>	<b>0.40</b>	<b>1,200</b>	<b>480</b>	<b>0.40</b>	<b>1,200</b>	<b>480</b>	<b>0.40</b>

**Table 1-3** Runoff Coefficient

Surface Description	Runoff Coefficient	Area (sq ft)					
Asphalt	0.90	1,200	1,080	0.90	1,200	1,080	0.90
Concrete	0.90	1,200	1,080	0.90	1,200	1,080	0.90
Grass	0.15	1,200	180	0.15	1,200	180	0.15
Gravel	0.30	1,200	360	0.30	1,200	360	0.30
Soil	0.10	1,200	120	0.10	1,200	120	0.10
Wood	0.10	1,200	120	0.10	1,200	120	0.10
Roof	0.90	1,200	1,080	0.90	1,200	1,080	0.90
Other	0.10	1,200	120	0.10	1,200	120	0.10
<b>Total</b>	<b>0.40</b>	<b>1,200</b>	<b>480</b>	<b>0.40</b>	<b>1,200</b>	<b>480</b>	<b>0.40</b>

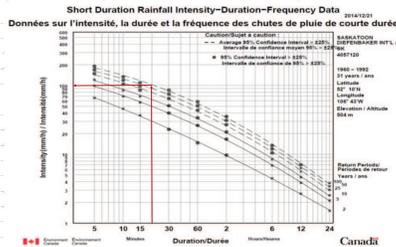
**Table 1-4** Runoff Coefficient

Surface Description	Runoff Coefficient	Area (sq ft)					
Asphalt	0.90	1,200	1,080	0.90	1,200	1,080	0.90
Concrete	0.90	1,200	1,080	0.90	1,200	1,080	0.90
Grass	0.15	1,200	180	0.15	1,200	180	0.15
Gravel	0.30	1,200	360	0.30	1,200	360	0.30
Soil	0.10	1,200	120	0.10	1,200	120	0.10
Wood	0.10	1,200	120	0.10	1,200	120	0.10
Roof	0.90	1,200	1,080	0.90	1,200	1,080	0.90
Other	0.10	1,200	120	0.10	1,200	120	0.10
<b>Total</b>	<b>0.40</b>	<b>1,200</b>	<b>480</b>	<b>0.40</b>	<b>1,200</b>	<b>480</b>	<b>0.40</b>

**Table 1-1** Roughness coefficients for sheet flow (Flow depth generally  $\leq 0.1$  feet)

Surface description	$n^1$
Smooth surface (concrete, asphalt, gravel, or bare soil)	0.011
Fallow (no residue)	0.05
Cultivated soils	0.05
Residue cover $\leq 20\%$	0.06
Residue cover $> 20\%$	0.17
Grass	
Short grass prairie	0.15
Dense grasses <sup>2</sup>	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woody	
Light underbrush	0.40
Dense underbrush	0.80

1 The n values are a composite of information compiled by Engman (1996).  
2 Includes species such as weeping lovegrass, bluegrass, buffalograss, blue grama grass, and native grass mixtures.  
3 When selecting n, consider cover to a height of about 0.1 ft. This is the only part of the plant cover that will obstruct sheet flow.



**Table 3-1** Runoff Coefficients for Rational Formula

Type of Drainage Area	Runoff Coefficient, C <sup>1</sup>
Concrete or Asphalt Pavement	0.8 - 0.9
Commercial and Industrial	0.7 - 0.9
Gravel Roadways and Shoulders	0.5 - 0.7
Residential - Urban	0.5 - 0.7
Residential - Suburban	0.3 - 0.5
Undeveloped	0.1 - 0.3
Berms	0.1 - 0.3
Agricultural - Cultivated Fields	0.15 - 0.4
Agricultural - Pastures	0.1 - 0.4
Agricultural - Forested Areas	0.1 - 0.4

For flat slopes or permeable soil, lower values shall be used. For steep slopes or impermeable soil, higher values shall be used. Steep slopes are 2:1 or steeper.  
From Michigan State Administrative Rules R 280.9.

**Table B-2** Runoff Coefficients for Urban Areas

Land Use	C (2 year)
Single family residential <sup>1</sup>	0.30
Multi-unit residential, industrial and commercial <sup>2</sup>	0.60
Parks, cemeteries, playgrounds, landscaped areas (lawns, gravel, etc.)	0.10
Unimproved & undeveloped	0.05
Streets, sidewalks, parking lots	Asphalt, concrete, brick, etc. 0.95
Gravel (compacted)	0.50
Roofs	0.95



**PINTER**  
& ASSOCIATES LTD

## **Appendix J**

### **SaskEnergy Confirmation**



## Cost Estimate

WR# 341238

August 18, 2022

Dan Beaulac  
DB Ventures  
120 Maple Rd  
Aberdeen, SK, S7V 0A4

Delivered by email to: dan@dbventures.ca

Dear Dan:

SaskEnergy has completed the conceptual design to provide natural gas service to 3 lots in rural subdivision located within NE-35-35-04-W2. It is understood that the following costs are conceptual in nature and are not an offer of service by SaskEnergy.

### Service Plan

This design will provide an average maximum load of 40.8 m<sup>3</sup>/hr at 1.75 kPa delivery pressure, with four points of delivery (the "Service Plan"). Construction includes the installation of:

- 130 meters of 33.4 P.E. pipe / Lot
- Meter: AL1000

### Your Contribution

Under SaskEnergy's *Terms & Conditions of Service Schedule*, an applicant or customer who authorizes construction for a new installation ("you" or the "Customer") will be responsible for all SaskEnergy construction costs and service fees associated with that new service unless otherwise agreed to by SaskEnergy in a Written Service Agreement.

SaskEnergy is prepared to invest in this project and to reduce the amount otherwise payable by you. Your total customer contribution for the above Service Plan is estimated at **\$11,000.00/Lot** before Saskenergy investment. Saskenergy investment is calculated by actual load requirements so cannot be included in this conceptual offer.

At the time of meter activation, your account would be subject to a connection fee of \$ 115.00. For accounts without an established credit history, a security deposit based on anticipated annual consumption may be required.

### General Servicing Conditions

All Services are subject to SaskEnergy's *Terms & Conditions of Service Schedule*, which is available online at [saskenergy.com](http://saskenergy.com). All capitalized terms in this letter shall have the meaning given to them in SaskEnergy's *Terms & Conditions of Service Schedule*, unless otherwise defined herein.

This estimate of cost is for informational purposes only and is based on construction in Summer Conditions. It is not an offer or a quote, and our investment may change if the cost or scope of the project changes. It is our opinion as to what the cost *may* be.

This estimate is based on the information provided and available, and on the following assumptions:

- Customer has facility installation route at final grade, clear of obstructions, and ready for service.
- SaskEnergy is able to obtain all required easements and approvals from third parties.
- Native material can (in SaskEnergy's opinion) be used for backfill of all excavations.

### **Project Requirements**

In order to proceed with a final design, please contact us when your plans and building site location are finalized. SaskEnergy will arrange to meet with you to finalize our route selection and to provide a customer offer. Construction can take two months or more from the time we receive your acceptance of the final offer pending route selection.

If you have any questions or require additional information, please contact me at the number listed below.

Sincerely,



Travis Coburn

Customer Connect Technician

**SaskEnergy**

40 Palliser Way | Yorkton, SK S3N 4C5

| c. 306.338.9601 |

[customerconnect1@saskenergy.com](mailto:customerconnect1@saskenergy.com) | [saskenergy.com](http://saskenergy.com)

*The foregoing is intended to provide an ESTIMATE ONLY. Labour and material costs are subject to change. This estimate assumes the information provided by you is correct, that there are no further developments or information which would cause us to vary our preliminary opinion, and nothing out of the ordinary is encountered in the course of completing this project. It assumes summer construction conditions, that native backfill can be used and that all requisite consents and approvals can be obtained.*



## Offer of Service

WR# 275724

December 18, 2017

101046965 Saskatchewan Ltd  
c/o Dan Beaulac  
RR 6 Site 601 Box 103  
Saskatoon, SK S7K 3J9

Delivered by email to: dan@dbventures.ca

Dear Dan:

SaskEnergy has completed the design to provide natural gas service to 7 commercial lots located NE 35 – 35 – 04 W3.

**Please review this offer carefully, in particular the *General Servicing Conditions* section, which outlines potential additional costs.**

### Service Plan

This design (the "Service Plan") includes the Main infrastructure only and will supply an average load of 25 m<sup>3</sup>/hr to each lot. The design includes 480 m of pipe.

The cost of the Service Line and Regulating Equipment has not been included and will be quoted at the time of installation request.

### Your Contribution

Under SaskEnergy's *Terms & Conditions of Service Schedule*, an applicant or customer who authorizes construction for a new installation ("you" or the "Customer") will be responsible for all SaskEnergy construction costs and service fees associated with that new service unless otherwise agreed to by SaskEnergy in a Written Service Agreement.

Due to SaskEnergy's customer connection workload and scheduling, the installation of your requested service may occur when winter conditions exist. Winter conditions exist when there is snow, or the ground is otherwise likely to be frozen, in SaskEnergy's sole discretion. Winter conditions may require different or additional equipment to be mobilized and generally increase the time and costs of construction.

Your total customer contribution has been calculated for both summer and winter conditions. If you do not want to incur the costs associated with installation of your service in winter conditions, you can accept this offer with this year's summer pricing and decline winter pricing. If you decline winter pricing, work may be deferred until spring of 2018 in the event that winter conditions are expected or become likely, in SaskEnergy's sole discretion.

SaskEnergy is prepared to invest in this project and to reduce the amount otherwise payable by you. Your total customer contribution for the above Service Plan has been calculated as follows:

	<b>Summer 2018</b>	<b>Winter 2018</b>
Project cost:	<b>\$ 55,045.68</b>	<b>\$ 75,614.99</b>
GST:	<b>\$ <u>2,752.28</u></b>	<b>\$ <u>3,780.75</u></b>
<b>Your total contribution:</b>	<b>\$ 57,797.96</b>	<b>\$ 79,395.74</b>

Payment options are outlined in the attached Customer Confirmation Form.

### **General Servicing Conditions**

Any changes to the Service Plan will require the agreement of SaskEnergy, and may have an additional cost. If changes are required, please contact SaskEnergy for a new quote.

All Services are subject to SaskEnergy's *Terms & Conditions of Service Schedule*, which is available online at [saskenergy.com](http://saskenergy.com). All capitalized terms in this letter shall have the meaning given to them in SaskEnergy's *Terms & Conditions of Service Schedule*, unless otherwise defined herein.

Easement(s) are required for your installation. SaskEnergy will prepare and forward the required easement agreement(s) for the right-of-way plan for you to execute and return, and we will advise you when the easement(s) has been registered. You shall not sell or transfer the parcel or individual lots in NE 35 – 35 – 04 W3 before the easement(s) has been registered. You will be responsible for any and all costs incurred by SaskEnergy to acquire the easement(s) in the event that you fail to comply with said obligation.

**This offer is open for acceptance until January 5, 2018.**

This offer is based on:

- A. "You" or the "Customer" meeting the following conditions:
  - All Customer notification, documentation and information requirements outlined in the *Project Documentation and Requirements* section below have been provided.
  - Customer has survey pins in place and clearly visible prior to construction of SaskEnergy's facilities.
  - As required by SaskEnergy, in its sole discretion, Customer has roads, sewer, and water in affected areas completed prior to construction of SaskEnergy's facilities.
  - Customer has facility installation route at final grade, clear of obstructions, and ready for service.
  
- B. The following additional conditions:
  - SaskEnergy is able to obtain all required permits, licenses, government approvals, easements and consents from third parties.
  - Native material can (in SaskEnergy's opinion) be used for backfill of all excavations.
  - The work is not performed under winter conditions. Winter conditions exist when there is snow, or the ground is otherwise likely to be frozen, in SaskEnergy's sole discretion.

These conditions are conditions precedent to the contract, are for the sole benefit of SaskEnergy, and may be waived by SaskEnergy. If these conditions are not met at the time

work is to proceed, SaskEnergy may treat the contract as at an end, without further obligation to the customer. All Deposits or payments hereunder shall be returned, less a charge for services provided on a Variable Charge Basis. In the event SaskEnergy waives a condition precedent, and elects to proceed, SaskEnergy may delay construction until the condition is addressed with such time conditions as SaskEnergy deems appropriate. SaskEnergy shall have the right but no obligation to perform minor Customer obligations hereunder. In the event native backfill is not suitable, as determined by SaskEnergy, SaskEnergy may provide same at its discretion and Customer shall be responsible for additional costs on a Variable Charge Basis. All waivers resulting in a delay in construction shall be in writing.

In the event an accepted offer is not received by the date provided, no binding contract shall exist.

Your contribution quoted above includes ONE construction crew mobilization. In the event a crew is mobilized and work cannot proceed for any of the above reasons, additional crew mobilizations will be at your cost, on a Variable Charge Basis. SaskEnergy reserves the right to determine the timing of the installation of Facilities when by reason of weather, conditions of excavation, and/or other circumstances beyond its control, SaskEnergy deems it inadvisable to install Facilities.

To facilitate compliance with The Occupational Health and Safety (Prime Contractor) Regulations the customer shall be responsible for:

- (1) providing SaskEnergy with temporary workspace, under the sole control of SaskEnergy, fifteen (15) metres from the existing and any proposed pipeline route on either side, or such other distance as SaskEnergy may reasonably direct, cordon off or barricade for the duration of the work (up to 30 metres from the edge of the pipeline, or easement); and
- (2) ensuring that all construction and other work remains outside of the temporary workspace until completion of the work, unless otherwise permitted by SaskEnergy.

### **Project Documentation and Requirements**

1. Please complete and return the attached Customer Confirmation Form.
2. Upon receipt of the Customer Confirmation Form, SaskEnergy will provide you with a proposed route of service drawing for your approval and signature.
3. Once SaskEnergy receives the signed proposed route of service drawing, any approvals that may be required for the work to begin will be submitted by SaskEnergy to the appropriate stakeholders. Approvals may include, but are not limited to, the following:
  - RM approval
  - City/town approval
  - Easement approvals
  - Highway or railway crossing approvals
  - Third party crossing approvals
  - Environmental/heritage approvals

**Depending on the type of approvals required, the start of the project could be delayed.** Easement, highway, or railway approvals can take, in some instances, several months to obtain.

**4. We will also require the following from you in order for the project to proceed:**

- **All information requested in the *Route & Grade Approval form* (attached)**
- **Site is at final grade**
- **Survey pins are in place and fully visible**
- **The final Plan of Survey that shows pins, angles and distances. The plan does not have to be registered with Information Services Corporation (ISC), but it must be a final plan, not a proposal.**

5. After obtaining all approvals and receiving the above required information, your file will be added to SaskEnergy's schedule of upcoming construction projects. Installation timelines vary by area and time of year. They could be approximately two months or more from the time the file is placed on the schedule. In order to better secure a place in the Year construction season schedule, please execute and return the attached Customer Confirmation Form as soon as possible.

In recent years, projects of this type have taken an average of 116 calendar days to complete after SaskEnergy has received this signed agreement. If work proceeds similar to recent years, installation should occur in April 2018 (Winter construction). **The completion timeline is an estimate and shall not be binding on SaskEnergy.**

By accepting this offer, you agree to execute and deliver such further documents and consents and do such further acts and things as SaskEnergy may reasonably request to evidence, carry out and give full effect to the terms, conditions, intent and meaning of this letter.

If you have any questions or require additional information, please contact me at the number listed below.

Sincerely,



Kelly Cameron  
Business Supervisor, SaskEnergy  
408 – 36<sup>th</sup> St E  
Saskatoon, SK S7K 6K8  
Phone: (306) 975 – 8573  
Fax: (306) 975 – 8558  
Email: kcameron@saskenergy.com

cc: Saskatoon East/West Rural Operations, Project File  
Enclosure(s):



WR# 275724

December 18, 2017

**Customer Confirmation Form – Summer 2018**

To confirm your acceptance of SaskEnergy’s Offer of Service, please complete, sign and return this form. Please indicate chosen payment option below.

**Payment Options**

Please select ONE of the following payment options:

- Option 1 – SaskEnergy will invoice \$ 57,797.96 after receipt of Customer Confirmation Form.**  
Construction will proceed after payment has been received.
- Option 2 – Letter of credit for full amount of \$ 57,797.96 to be provided upon execution of Customer Confirmation Form.** SaskEnergy will contact you to inform you of the requirements for the letter of credit. Full payment is due and payable upon project completion. Any balance owing 30 days after invoicing will be collected by SaskEnergy from the letter of credit.

*By deferring any portion of payment until after construction (an “extension of credit”), and by my signature below, I hereby authorize SaskEnergy to complete a credit check. Credit check(s) shall include, without limitation, the acquisition, retention and review of a credit report from a credit reporting agency. This credit report will contain credit information, personal information or both. I acknowledge that SaskEnergy may require consent pursuant to The Credit Reporting Act, and I hereby consent to SaskEnergy obtaining and utilizing a credit report in connection with the extension of credit to myself and/or the collection of any resulting debt. No binding contract shall exist until credit is reviewed and approved by SaskEnergy, in SaskEnergy’s sole discretion. SaskEnergy may, but shall not be required to, delay scheduling of work until payments due on execution of this agreement are received.*

**Customer Information (Please Print)**

Name (print) \_\_\_\_\_ Company \_\_\_\_\_

Mailing Address \_\_\_\_\_

Community \_\_\_\_\_ Prov \_\_\_\_\_ Postal Code \_\_\_\_\_

Service Address (if different from above) \_\_\_\_\_

Driver’s license # \_\_\_\_\_ Date of Birth (mm/dd/yy) \_\_\_\_/\_\_\_\_/\_\_\_\_

Signed \_\_\_\_\_ Date \_\_\_\_\_

By my signature above I declare I am authorized to sign on behalf of \_\_\_\_\_.

Please return to:

SaskEnergy Customer Service  
Attention: Kelly Cameron  
408 – 36<sup>th</sup> St E  
Saskatoon, SK S7K 6K8

SaskEnergy’s GST number is 119 429 751.



WR# 275724

December 18, 2017

**Customer Confirmation Form – Winter 2018**

To confirm your acceptance of SaskEnergy’s Offer of Service, please complete, sign and return this form. Please indicate chosen payment option below.

**Payment Options**

Please select ONE of the following payment options:

- Option 1 – SaskEnergy will invoice \$ 79,395.74 after receipt of Customer Confirmation Form.** Construction will proceed after payment has been received.
- Option 2 – Letter of credit for full amount of \$ 79,395.74 to be provided upon execution of Customer Confirmation Form.** SaskEnergy will contact you to inform you of the requirements for the letter of credit. Full payment is due and payable upon project completion. Any balance owing 30 days after invoicing will be collected by SaskEnergy from the letter of credit.

*By deferring any portion of payment until after construction (an “extension of credit”), and by my signature below, I hereby authorize SaskEnergy to complete a credit check. Credit check(s) shall include, without limitation, the acquisition, retention and review of a credit report from a credit reporting agency. This credit report will contain credit information, personal information or both. I acknowledge that SaskEnergy may require consent pursuant to The Credit Reporting Act, and I hereby consent to SaskEnergy obtaining and utilizing a credit report in connection with the extension of credit to myself and/or the collection of any resulting debt. No binding contract shall exist until credit is reviewed and approved by SaskEnergy, in SaskEnergy’s sole discretion. SaskEnergy may, but shall not be required to, delay scheduling of work until payments due on execution of this agreement are received.*

**Customer Information (Please Print)**

Name (print) \_\_\_\_\_ Company \_\_\_\_\_

Mailing Address \_\_\_\_\_

Community \_\_\_\_\_ Prov \_\_\_\_\_ Postal Code \_\_\_\_\_

Service Address (if different from above) \_\_\_\_\_

Driver’s license # \_\_\_\_\_ Date of Birth (mm/dd/yy) \_\_\_\_/\_\_\_\_/\_\_\_\_

Signed \_\_\_\_\_ Date \_\_\_\_\_

By my signature above I declare I am authorized to sign on behalf of \_\_\_\_\_.

Please return to:

SaskEnergy Customer Service  
Attention: Kelly Cameron  
408 – 36<sup>th</sup> St E  
Saskatoon, SK S7K 6K8

SaskEnergy’s GST number is 119 429 751.

December 18, 2017

## Route & Grade Approval

We appreciate your assistance in supplying us with the following:

1. Plans indicating existing and proposed sewer and water mains (if applicable).
2. Location of road, power, telephone, cable, and other utilities.
3. Normal grade specifications of 1.0 meters in easements and lanes, 1.2 meters in streets and intersections. A plan or description showing these final grades would be appreciated, especially if there are significant elevation changes.

**Please sign and return ONE original main extension sketch along with any comments** as soon as the "final grade" of the service area is determined. Your service request cannot be scheduled for construction until this *Route & Grade Approval* is received.

Please submit all materials to your project contact listed below:

**Project Contact:** Kelly Cameron  
Saskatoon Area  
408 – 36<sup>th</sup> St E  
Saskatoon, SK S7K 6K8

**Phone:** (306) 975 – 8573

**Fax:** (306) 975 – 8558

**Email:** [kcameron@saskenergy.com](mailto:kcameron@saskenergy.com)

Thank you for your assistance in this matter. We look forward to serving you.

Sincerely,



Kelly Cameron  
Business Supervisor, SaskEnergy

cc: Saskatoon East/West Rural Operatins, Project File  
Enclosure(s):





**PINTER**  
& ASSOCIATES LTD

## **Appendix K**

### **SaskPower Confirmation**

## Distribution Services

February 18, 2022

**Notification No. 302853206**

PINTER & ASSOCIATES LTD  
710A 48TH ST E  
SASKATOON, SK S7K 5B4  
(the "Customer")

Re: Subdivision at NE 35-35-04-W3 (the "Site")

Please accept this letter as confirmation that there is electrical service available to provide power to your subdivision.

Once you have received your approval from the RM of Corman Park and wish to proceed please call our office at 1-888-757-6937. At that time we will provide you with a written quote setting out the costs and terms and conditions to move your project forward.

If you require anything else at this time please let us know by contacting [customerrelations@saskpower.com](mailto:customerrelations@saskpower.com).

**SASKATCHEWAN POWER CORPORATION**



Justin Bloor - Business Manager, Customer Relations – Saskatoon Region

## Distribution Services

July 8, 2022

CONFIRMATION LETTER

SUBJECT: ELECTRICAL SERVICE

To Whom it May Concern:

Re: Subdivision at Parcel B, Plan No. 98MW20997 & Parcel C, Plan No. 102326431, RM of Corman Park (the "Site")

Please accept this letter as confirmation that there is electrical service available to provide power to your subdivision.

Once you have received your approval from the RM of Corman Park and wish to proceed please call our office at 1-888-757-6937. At that time we will provide you with a written quote setting out the costs and terms and conditions to move your project forward.

If you require anything else at this time please let us know by contacting [customerrelations@saskpower.com](mailto:customerrelations@saskpower.com).

**SASKATCHEWAN POWER CORPORATION**



---

Justin Bloor - Business Manager, Customer Relations – Saskatoon Region



**PINTER**  
& ASSOCIATES LTD

**Appendix L**  
**SaskWater Confirmation**

**From:** Bob Lys <[Bob.Lys@saskwater.com](mailto:Bob.Lys@saskwater.com)>  
**Sent:** Thursday, November 23, 2017 3:22:05 PM  
**To:** Dan Beaulac <[dan@dbventures.ca](mailto:dan@dbventures.ca)>  
**Subject:** Water Supply to Proposed Subdivision NE 35-35-04-W3M

Dan,

The following is further to our telephone conversation this afternoon regarding your proposed subdivision at the above noted location which will result in an increase in the number of end users on the existing SaskWater service connection from one to eventually seven.

- As discussed, this increase in users will require a change in the contracted flow rate for the connection from the current 0.5 igpm to an estimated 3.5 igpm. Current system modelling indicates that SaskWater can accommodate this marginal increase in flow without issue.
- The increase in contracted flow will result in an associated increase to the monthly minimum charge. The current minimum of 12 cubic metres per month will be ramped up to 84 cubic metres per month as the proposed subdivision becomes developed.
- Only minor adjustments will be required in the SaskWater manhole to accommodate the increase in flow, so no additional infrastructure related costs are expected.
- Your Point of Delivery will continue to be the curb-stop located at the property line.
- All distribution lines downstream of the Point of Delivery will remain your responsibility.
- Once a submission has been made for RM approval, please submit the attached Request for Service form to SaskWater so that we can provide conditional approval for the request until the subdivision commences development and a new Water Supply Agreement has been drafted.

Please let me know if you require any further information at this time.

Thanks,  
Bob

**Bob Lys**

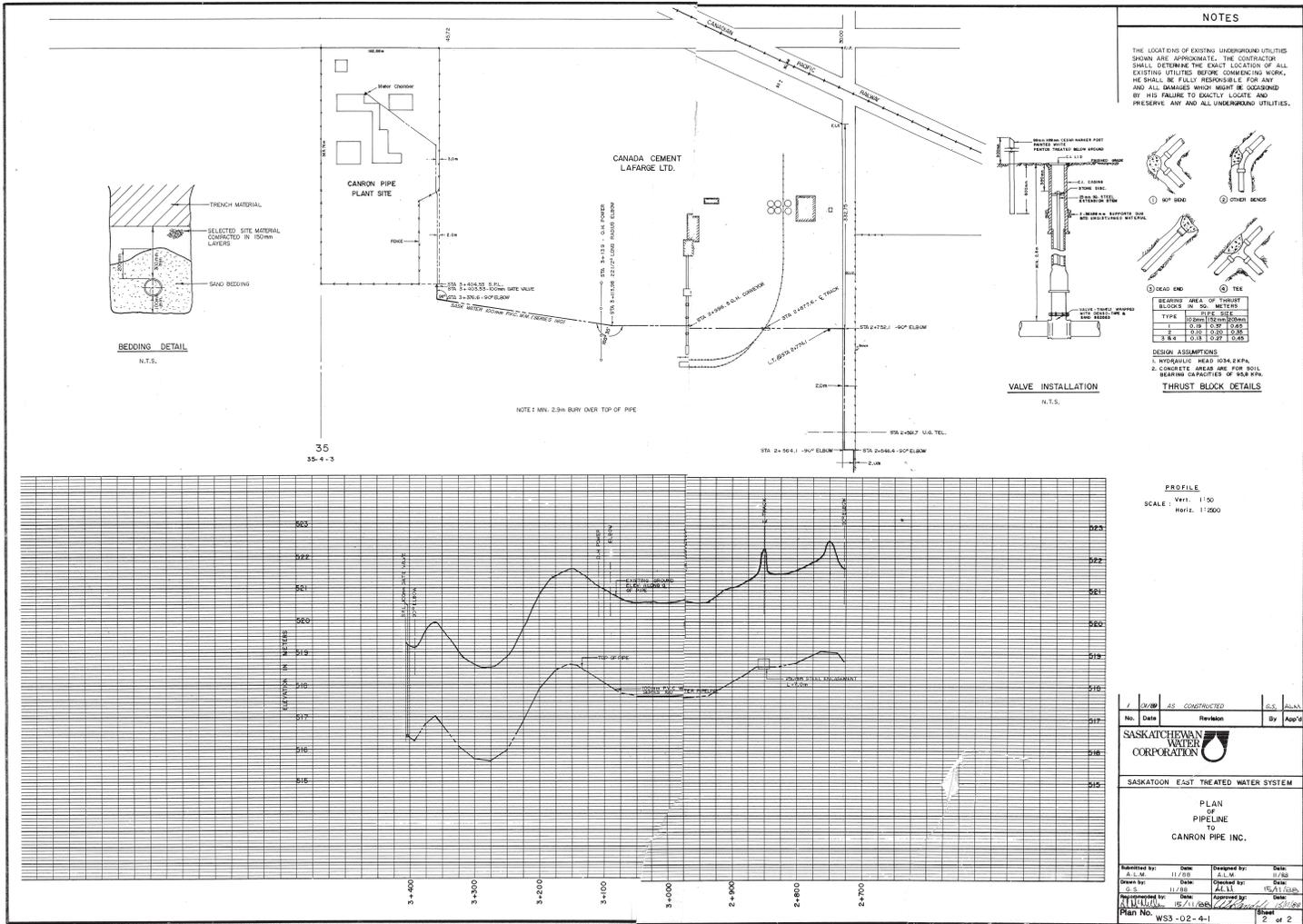
Manager  
Customer Service



200 - 111 Fairford Street East  
Moose Jaw, SK, S6H 1C8  
Phone: 306-694-3784  
Fax: 306-694-3207  
[bob.lys@saskwater.com](mailto:bob.lys@saskwater.com)  
[www.saskwater.com](http://www.saskwater.com)

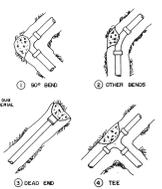
CONFIDENTIALITY NOTICE: This e-mail was intended for a specific recipient. It may contain information that is privileged, confidential, or exempt from disclosure. Privilege and confidentiality is not waived. If the reader is not the intended recipient, use or distribution of this information is prohibited. If you have received this communication in error, please notify the sender by telephone or return e-mail and permanently delete or destroy all copies of the message.

*Please consider the environment before printing this e-mail.*



**NOTES**

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES SHOWN ARE APPROXIMATE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. HE SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCURRED BY HIS FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.



**VALVE INSTALLATION**  
N.T.S.

**PROFILE**  
SCALE: Vert: 1:50  
HORIZ: 1:200

1		AS CONSTRUCTED		C.S. ALAN	
No.	Date	Revision	By	App'd	
SASKATOON EAST TREATED WATER SYSTEM					
PLAN OF PIPELINE TO CANON PIPE INC.					
Submitted by:	Date:	Designed by:	Date:		
A.L.M.	11/98	A.L.M.	9/98		
Drawn by:	Date:	Checked by:	Date:		
G.S.	11/98	A.L.L.	10/11/98		
Approved by:	Date:	Approved by:	Date:		
A.L.L.	10/11/98				
Plan No.	W33-02-4-1			Sheet 2 of 2	

**Appendix M**  
**SaskTel Confirmation**



Access Network Engineering  
5th, 140 - 1st Ave North  
Saskatoon, SK  
S7K 1W8

July 26, 2022

RE: Confirmation Letter of SaskTel Services

To whom it may concern:

Please accept this letter as confirmation that SaskTel has copper cable in the area for basic phone service and fibre optic cable in the area for large data services. There is no availability DSL interNET or GPON infINET available within this area.

Note that this subdivision is outside the Base Rate boundary of Saskatoon and Clavet, so rural connection and rating fees apply for copper and fibre.

If you require any further information, please contact me at (306) 931-5290 or by email [Jeremy.vancaeseele@sasktel.com](mailto:Jeremy.vancaeseele@sasktel.com)

Yours truly,

A handwritten signature in blue ink that reads "Jeremy VanCaeseele". The signature is written in a cursive, flowing style.

---

Jeremy VanCaeseele  
Engineering Manager – Access Network



**PINTER**  
& ASSOCIATES LTD

## **Appendix N**

### **Solid Waste Removal Confirmation**



May 13, 2022

CONFIRMATION LETTER

RE: Garbage, Recycling & Septic Services

To Hewison Holdings,

This letter is confirmation that GFL (Green For Life) Environmental Inc. can provide garbage, recycling and septic waste removal services for the proposed subdivision plans attached below.

GFL Environmental Inc. has been proudly serving the Canadian marketplace for over 25 years and we look forward to building a mutually beneficial relationship between GFL our clients.

GFL develop programs that deliver cost effective solutions and industry expertise, that prioritize Safety, Regulatory Compliance, Environmental Compliance, and a "Recycle First" approach to managing our customers' waste. The value we deliver to our clients is a result of customizing our waste services programs, directly to the individual needs of the location.

The GFL Environmental Network offers an unmatched "One Stop Shop" to our partners. This offering includes Solids Services (overhead, roll off services, municipal type wastes) Liquids Services (Regulated and Hazardous Wastes), and Industrial Services (Industrial Cleaning, Septic and Vac Truck) all designed to meet the individual needs of our mining customers. GFL is a member in good standing on ISNet World and all facilities are COR Certified. Certificates can be made available upon request.

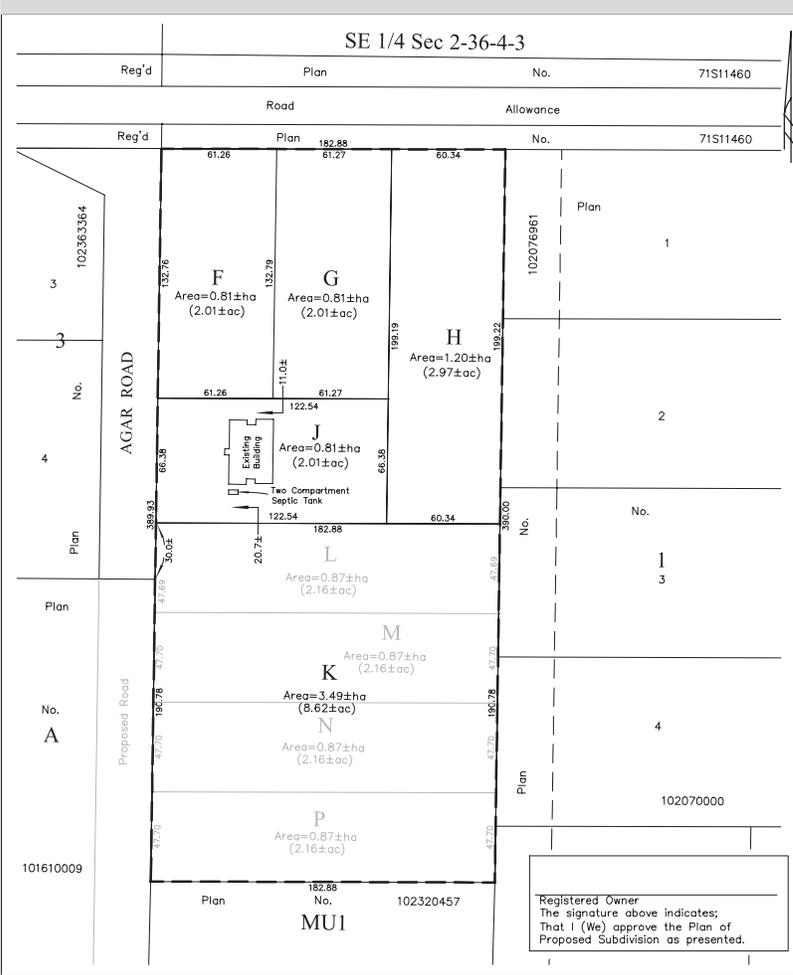
If you have any question or concerns, please feel free to reach out to me anytime.

Thank you,

A handwritten signature in black ink, appearing to read 'Ray Poppl'.

**Ray Poppl**  
Director, Operations, Saskatchewan & Manitoba





**PLAN SHOWING**

**PLAN OF PROPOSED SUBDIVISION**  
OF ALL OF  
**PARCEL B, REG'D PLAN NO. 98MW20997 &**  
**PARCEL C, PLAN NO. 102326431**  
**IN THE R.M. OF CORMAN PARK No. 344**  
**SASKATCHEWAN**  
**2021**  
**SCALE = 1: 2000**



**NOTES**

- MEASUREMENTS ARE IN METRES AND DECIMALS THEREOF.
- SOME MEASUREMENTS ARE APPROXIMATE AND MAY DIFFER FROM THE FINAL PLAN OF SURVEY BY AS MUCH AS 5 METRES.
- PORTION TO BE APPROVED IS OUTLINED WITH BOLD DASHED LINE AND CONTAINS 7.13± ha (17.62± ac)

**SURVEYORS CERTIFICATION**

March 3, 2022  
Date

*[Signature]*  
Saskatchewan Land Surveyor

<b>Webb Surveys</b> (A Division of Midwest Surveys Inc.)	222 JESSOP AVE SASKATOON, SK S7N 1Y4 TEL: 306-955-5330	<b>No.</b>	<b>DATE</b>	<b>REVISION / ISSUED</b>	<b>JOB No.</b>	
		0	12/10/2021	FOR ISSUE	8C-0289-21	<b>1</b>
		1	03/04/2022	REVISED PARCELS		<b>REVISION</b>
		SURVEYED BY:		CALCD BY:	DRAWN BY: ND	

## **Appendix O**

### **Public Consultation Mailout Package**

**Date:** 11 July, 2022

**Attention:** Registered Landowner in RM of Corman Park

**Regarding:** Light Industrial Subdivision Application in RM of Corman Park

You have received this Public Consultation package regarding a subdivision application for a site within 1.6 km of property which you are listed as a registered owner.

The RM of Corman Park requires that a Public Consultation information package be provided for your review as a nearby landowner. Also, to allow opportunities for your comments to be provided back to the developer and RM staff as part of the subdivision application review process and Comprehensive Development Report.

You are a listed landowner with 1.6 km of the proposed development site:  
NE1/4 Sec 35-Rge35-W3M

Please review the provided information and the attached images/figures.

1. Proposed Development Summary
2. Regional Context Map
3. Local Context Map
4. Proposed Subdivision Layout Plan
5. Comment Form

Your comments can be returned by any of the following methods:

- Mail using the enclosed, stamped and addressed envelope
- A Scan or photo attachment sent to the email address provided
- Provided by phone to the developer at the contact number below

Please return all comments to one of the contact options below, not to the RM office.

**If you have no comments** regarding this subdivision; please simply return the blank form or provide a very brief response via phone/email that you have received the package and will not be providing any comments.

If you have questions regarding the information of content, please call or email [dan@dbventures.ca](mailto:dan@dbventures.ca) for further clarification.

Sincerely,

Dan Beaulac  
dbventures  
120 Maple Road  
RM of Aberdeen  
S7A 0A4  
[dan@dbventures.ca](mailto:dan@dbventures.ca)  
306-227-5597

## Proposed Development Summary

The proposed subdivision, zoned M1-Light Industrial, is located adjacent and immediately south of Township Road 360 (Floral Road) and approximately 700m east of Highway 16. The parcels are surrounded by existing Industrial permitted uses and agriculture operation to the north.

A majority of utility and service providers have confirmed their ability to provide the required level of servicing to accommodate the capacity required for this subdivision that will create an additional 3 lots.

An engineered Drainage Plan has been created to manage surface water runoff, retention and discharge. The Drainage Plan proposes storage sloughs with retention capacity for a 1:100 year storm event for each lot. Lot specific runoff volumes were determined for pre and post development flows. The full Drainage Plan will be included in the CDR.

The subdivision application will be submitted to the RM of Corman Park along with a required Comprehensive Development Report (CDR). The CDR will include all supporting information and relevant details for this subdivision. It will be available for review through the RM planning department and the public hearing held at an advertised future date.

Development Consideration	Proposed Subdivision
Land Location	NE Sec 35-Twp 35-Rge 4 W3
Parcel Designation	Parcel B Plan No. 98MW20997 & Parcel C Plan No. 102326431
Total Site Area	7.1ha (17.63 acres)
Proposed Lot Size	Min. 0.81ha (2.01 acres) Max 3.49ha (8.62 acres)
Existing Number of Lots	2
Proposed Number of Lots	5
Existing Zoning	M1 – Light Industrial District
Proposed Zoning	M1 – Light Industrial District (no change)

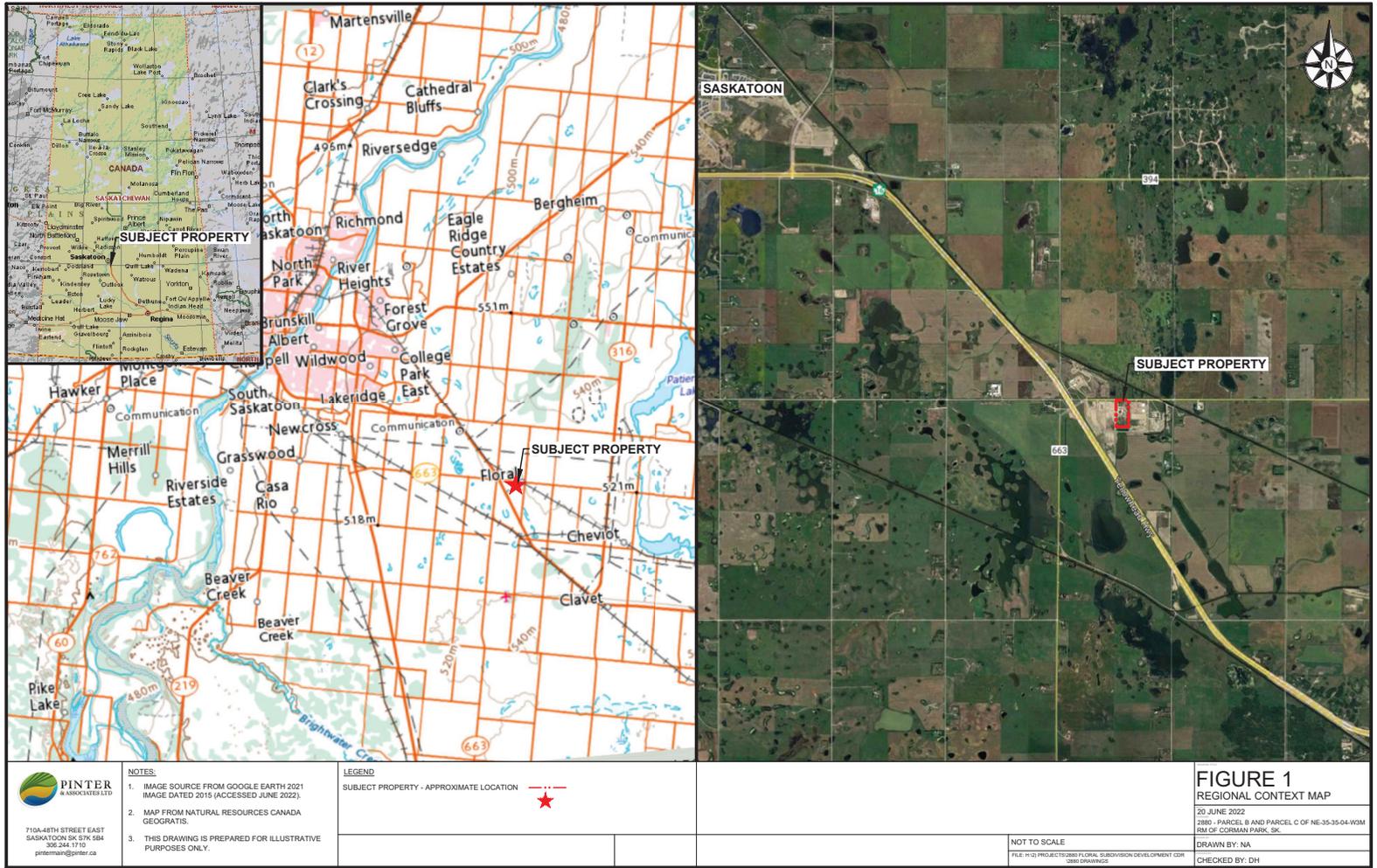
Please see a Potential Future Subdivision on Figure 4.

There will likely be a further subdivision of Lot K into 3 additional lots (4 total) at some future time after the south half of Agar Road is subdivided and registered to the RM of Corman Park.

Further cost sharing agreement between the developer and the RM will take place at that time.

Servicing and other parts of this CDR and subdivision application take into account a potential full buildout of 8 lots.





**PINTER**  
 ASSOCIATES LTD.  
 710A-48TH STREET EAST  
 SASKATOON SK S7K 5B4  
 306.244.1770  
 pintermain@pinter.ca

- NOTES:**
1. IMAGE SOURCE FROM GOOGLE EARTH 2021  
 IMAGE DATED 2015 (ACCESSED JUNE 2022).
  2. MAP FROM NATURAL RESOURCES CANADA  
 GEOGRATIS.
  3. THIS DRAWING IS PREPARED FOR ILLUSTRATIVE  
 PURPOSES ONLY.

**LEGEND**  
 SUBJECT PROPERTY - APPROXIMATE LOCATION



**FIGURE 1**  
**REGIONAL CONTEXT MAP**  
 20 JUNE 2022  
 2020 - PARCEL B AND PARCEL C OF NE-35-04-W3M  
 RM OF CORMAN PARK, SK.

NOT TO SCALE  
 FILE: H-2) PROJECT 0880 FLORAL SUBDIVISION DEVELOPMENT COR  
 0880 DRAWINGS

DRAWN BY: NA  
 CHECKED BY: DH



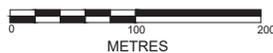
Image Source from Google Earth 2022, Image dated 2021 (Accessed June 2022)



710A-48TH STREET EAST  
SASKATOON SK S7K 5B4  
306.244.1710  
pintermain@pinter.ca

**LEGEND**

SUBJECT PROPERTY - APPROXIMATE LOCATION - . . . -



SCALE: 1: 6000

FILE: H:\2) PROJECTS\2880 FLORAL SUBDIVISION DEVELOPMENT CDR  
12880 DRAWINGS

DRAWING TITLE:

**FIGURE 2**

LOCAL CONTEXT MAP

DATE:  
20 JUNE 2022

PROJECT:  
2880 - PARCEL B AND PARCEL C OF NE-35-35-04-W3M  
RM OF CORMAN PARK, SK.

DRAWN BY:  
DRAWN BY: NA

CHECKED BY:  
CHECKED BY: DH

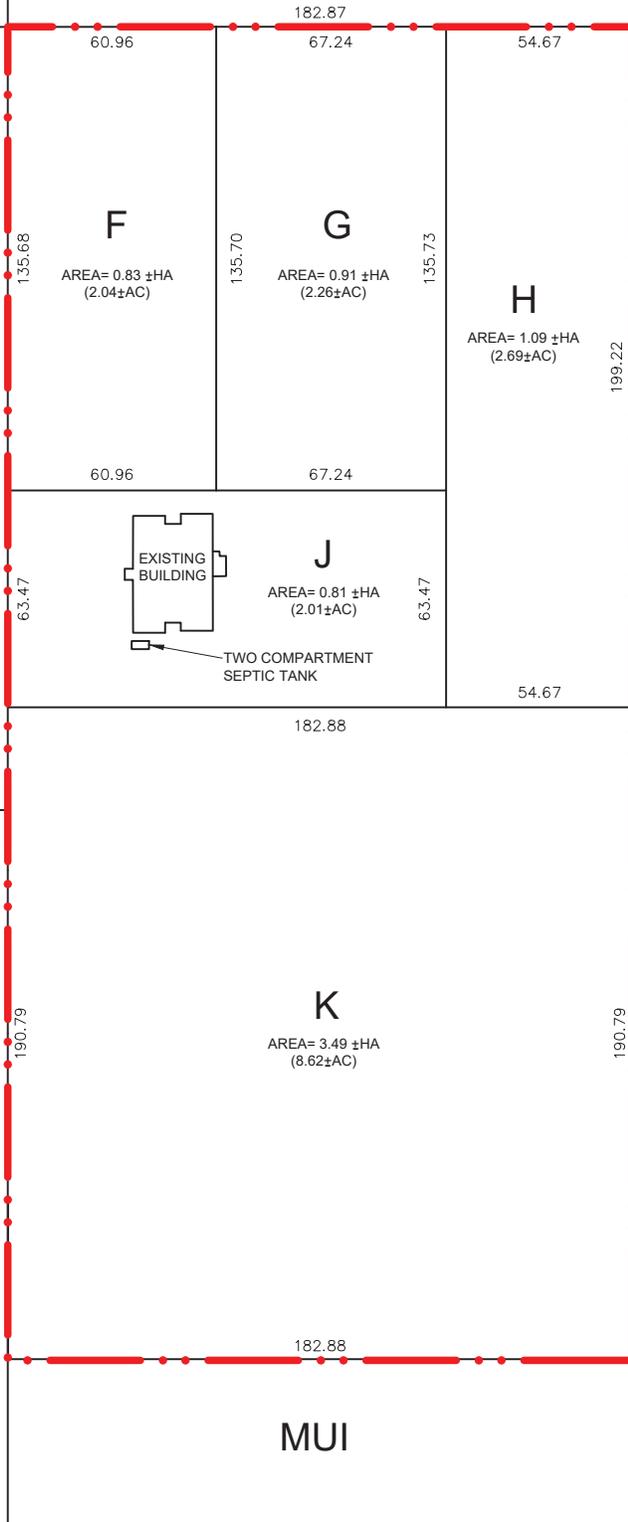
ROAD

ALLOWANCE



AGAR ROAD

PROPOSED ROAD



710A-48TH STREET EAST  
 SASKATOON SK S7K 5B4  
 306.244.1710  
 pintermain@pinter.ca

LEGEND

SUBJECT PROPERTY - APPROXIMATE LOCATION - - - - -



SCALE: 1: 2,200

FILE: H:12) PROJECTS\2880 FLORAL SUBDIVISION DEVELOPMENT CDR  
2880 DRAWINGS

DRAWING TITLE

FIGURE 3

PROPOSED SUBDIVISION LAYOUT PLAN

DATE

21 JUNE 2022

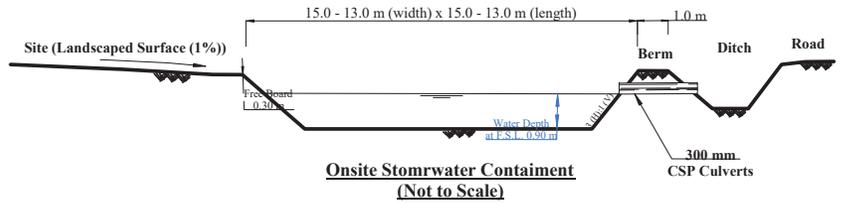
2880 - PARCEL B AND PARCEL C OF NE-35-35-04-W3M  
RM OF CORMAN PARK, SK.

DRAWN BY

DRAWN BY: NA

CHECKED BY

CHECKED BY: DH



710A-48TH STREET EAST  
SASKATOON, SK S7K 5B4  
306.244.1710  
pintermain@pinter.ca

**Notes:**

1. THIS DRAWING IS PREPARED FOR ILLUSTRATIVE PURPOSES ONLY.

**Legend:**

On-site Containment



**Figure 3a**

POST-DEVELOPMENT DRAINAGE PLAN  
OPTION (A) SEPARATE CONTAINMENT SLOUGHS

23 MARCH 2022  
LAND DEVELOPMENT AT NE-35-35-04-W3M, RM OF CORMAN PARK NO. 344, SK

DRAWN BY: IE

CHECKED BY: DH

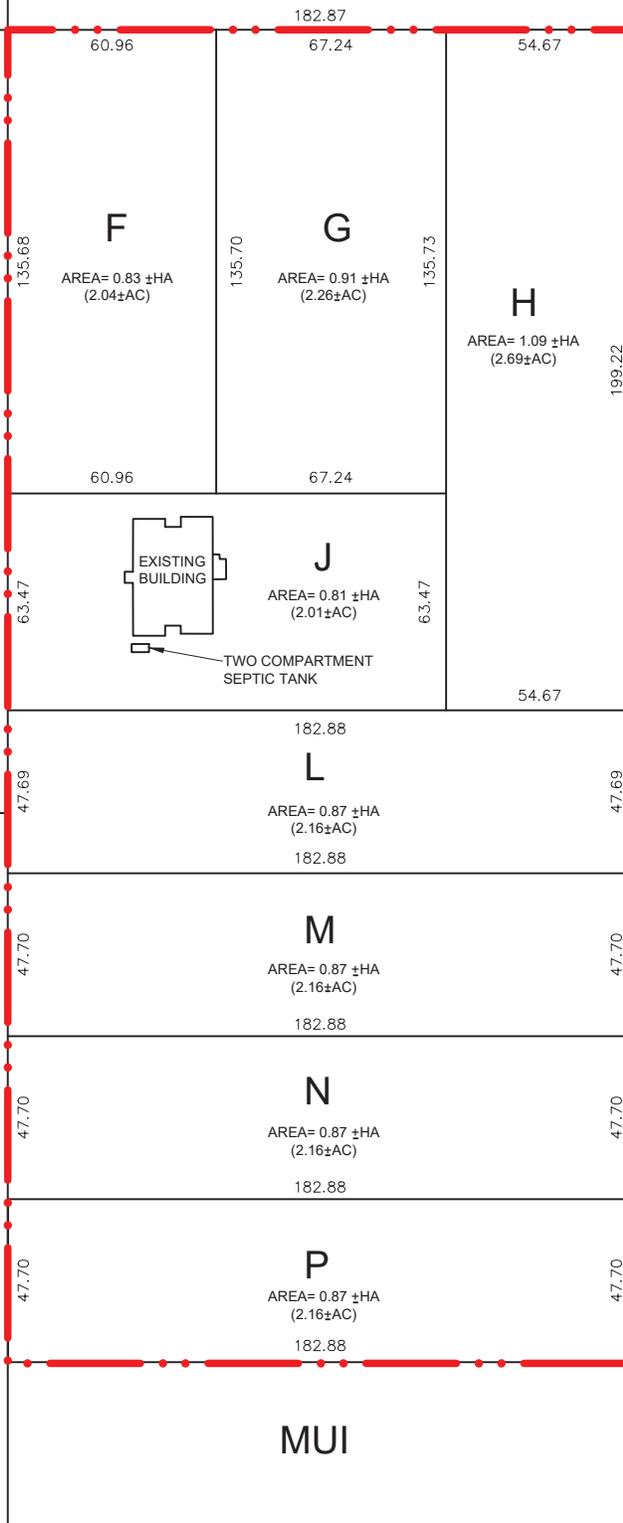
ROAD

ALLOWANCE



AGAR ROAD

PROPOSED ROAD



710A-48TH STREET EAST  
SASKATOON SK S7K 5B4  
306.244.1710  
pintermain@pinter.ca

LEGEND

SUBJECT PROPERTY - APPROXIMATE LOCATION - - - - -



SCALE: 1: 2,200

FILE: H:12) PROJECTS\2880 FLORAL SUBDIVISION DEVELOPMENT CDR  
2880 DRAWINGS

DRAWING TITLE

# FIGURE 4

POTENTIAL FUTURE SUBDIVISION PLAN

DATE  
22 JUNE 2022

PROJECT - 2880 - PARCEL B AND PARCEL C OF NE-35-35-04-W3M  
RM OF CORMAN PARK, SK.

DRAWN BY: NA

CHECKED BY: DH



**PINTER**  
& ASSOCIATES LTD

**Appendix P**  
**Public Response**

## Public Consultation Comment Form

Proposed M1-Light Industrial Subdivision  
Land Location: NE Sec 35-Twp 35-Rge 4-W3  
RM of Corman Park

1. Please provide your comments regarding this proposed subdivision:

We have no concerns to the subdivision  
application

---

---

---

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---

---

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---

---

2. Do you wish receive a follow up call in order to speak with the developer directly?

Yes  No

Date: July 19/22  
Printed Name: Blaine Dubrud Owner Signature: [Signature]  
Contact Phone: 306-380-7210 Contact Email: blaine@allanconstruction.ca  
Address: 131 Swan Crs Saskatoon, SK

Thank You for your time to review this package and your input on this application.

### Developer Contact Information:

Dan Beulac  
120 Maple Road  
RM of Aberdeen  
S7A 0A4  
[dan@dbventures.ca](mailto:dan@dbventures.ca)  
306-227-5597

PLEASE SUBMIT ALL COMMENTS BY **Thursday August 4<sup>th</sup>, 2022**

Public Consultation Comment Form

Proposed M1-Light Industrial Subdivision  
Land Location: NE Sec 35-Twp 35-Rge 4-W3  
RM of Corman Park

1. Please provide your comments regarding this proposed subdivision:

PRAIRIE WASTE MANAGEMENT LTD. (PWML) IS IN  
FULL SUPPORT OF THIS DEVELOPMENT.

2. Do you wish receive a follow up call in order to speak with the developer directly?

Yes  //  No

Date: 19 JULY 2022

Printed Name: LAWRENCE PINTER  
PRESIDENT

Owner Signature: 

Contact Phone: 306 244-2407

Contact Email: main@prairiewaste.ca

Address: 710 48<sup>th</sup> STREET EAST SASKATOON S7K 5B4

Thank You for your time to review this package and your input on this application.

Developer Contact Information:

Dan Beaulac  
120 Maple Road  
RM of Aberdeen  
S7A 0A4  
[dan@dbventures.ca](mailto:dan@dbventures.ca)  
306-227-5597

PLEASE SUBMIT ALL COMMENTS BY Thursday August 4<sup>th</sup>, 2022

## Public Consultation Comment Form

Proposed M1-Light Industrial Subdivision  
Land Location: NE Sec 35-Twp 35-Rge 4-W3  
RM of Corman Park

1. Please provide your comments regarding this proposed subdivision:

The University has encountered challenges from the runoff into our Bison area from previous development activities. Uncontrolled runoff coming through this subdivision can and has caused lasting reductions in our grazing area because of the wetland that expands as a result. We would like to ask for designs that exceed the 1:100 events due to the lasting impact on our Bison facility. Can you please provide the drainage plan for our review and comment prior to approval.

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2. Do you wish receive a follow up call in order to speak with the developer directly?

Yes  No

Date: Aug. 3, 2022

Printed Name: Branden Barnstable

Owner Signature: \_\_\_\_\_

Contact Phone: 306-966-8565

Contact Email: branden.barnstable@usask.ca

Address: A23 - 110 Maintenance Road, Saskatoon, SK S7N 5C5

Thank You for your time to review this package and your input on this application.

### Developer Contact Information:

Dan Beaulac  
120 Maple Road  
RM of Aberdeen  
S7A 0A4  
[dan@dbventures.ca](mailto:dan@dbventures.ca)  
306-227-5597

PLEASE SUBMIT ALL COMMENTS BY **Thursday August 4<sup>th</sup>, 2022**

Public Consultation Comments  
For Proposed M1-Light Industrial Subdivision  
Land Location: NE Sec 35-Twp35-Rge-4-W3  
Attn: Dan Beaulac

1. How are 8 separate buyer-developed retention ponds on a total of approx. 17 acres going to fit with good water runoff design? If each buyer needs to do their engineering, how will you be sure that this doesn't end up in dispute and disarray? Who gets left with all the likely arguments and problems that will occur - Corman Park and the neighbor developer?
2. Is this not an increased hazard in winter with icy conditions and 8 separate ponds positioned right next to Agar Rd, Floral Rd, and each business approach?
3. Land values will depreciate on our development when the mess of ponds, weeds and lots are viewed across the road.
4. Why not tap into the exiting water management system that is already built for the area? There already exists a professionally designed water management system.

We have serious concerns that if this development proceeds as planned it will cause property devaluation in the area and lead to unnecessary disarray and future disputes. As per Paula and Barry Ghiglione (East Floral Industrial Park)

**Appendix Q**  
**Water Security Agency Comments**

## Jessica Phelps

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**From:** Jessica Phelps  
**Sent:** Monday, October 24, 2022 2:02 PM  
**To:** James Hnatowich  
**Cc:** Spencer McNie  
**Subject:** RE: 2880 Floral Drainage Design

Hi James,

Thank you for the clarifications. If the storage pond is designed to retain the difference between pre- and post-development runoff for a 1:100-year event, in addition to permanently storing any volume of water displaced by the infilling of wetlands, then WSA has no further concerns.

Regards,

Jessica

**Jessica Phelps** - B.Sc. Hons, Geoscientist-in-Training

*Technologist, Water & Wastewater*  
402 Royal Bank Tower 1101 - 101st Street  
North Battleford, SK S9A 0Z5  
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**From:** James Hnatowich <james.hnatowich@pinter.ca>  
**Sent:** Friday, October 21, 2022 9:47 AM  
**To:** Jessica Phelps <Jessica.Phelps@wsask.ca>  
**Cc:** Spencer McNie <Spencer.McNie@wsask.ca>; Dustin Hicke <dustin.hicke@pinter.ca>; Ibrahim El-Baroudy <ibrahim.elbaroudy@pinter.ca>  
**Subject:** Re: 2880 Floral Drainage Design

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Good morning Jessica,

As the portions of impervious and semi-impervious land cover are unknown at this time, we used in our calculations 10% impervious, and 10% semi-impervious. You can see these assumptions on page 3, under the hydrological calculations section. 510 cubic meters of storage will be required based on these assumptions.

The drainage contour map shows the landscaped layout. The paths for the water to the storage ponds are detailed in the contour map and natural drainage paths (Figure 2, Appendix A) and the Post-Development Updated Drainage Plan In Figure 3, Appendix A. We've found that figures typically are the easiest way to represent how the drainage works. Are you hoping for something additional with this?

In regards to the WSA comments on the previous drainage design, this may have been a miscommunication between the RM and ourselves. We were under the understanding that the RM had discussed that with the WSA and had given verbal approval. This may have just been a miscommunication between the RM and ourselves. I can try to go through emails to see where this came from if this is vital. I can also just remove this reference from the technical memo.

Warm regards,

James

On Tue, Oct 18, 2022 at 3:02 PM Jessica Phelps <[Jessica.Phelps@wsask.ca](mailto:Jessica.Phelps@wsask.ca)> wrote:

Hi James,

The Drainage Plan you provided for the proposed subdivision has been reviewed. In the hydrological calculations it mentions there will be additional impervious and semi-pervious landcover in the developed areas. Can you clarify the quantity of additional hard-surface runoff that is predicted to be generated by the land that is being subdivided? The storage ponds will need to have capacity to contain this additional volume of water. Additionally, please explain how the water will get to the storage ponds once the lots have been infilled.

In the document it also speaks to comments Water Security Agency (WSA) previously provided on the initial drainage plan, can you please send me these comments?

There is an Approval to Construct and Operate Drainage Works (E5/105205) on the subdivision. This project and its requirements need to be respected.

If you have any questions, please let me know.

Regards,

Jessica

**Jessica Phelps** - B.Sc. Hons, Geoscientist-in-Training

*Technologist, Water & Wastewater*  
402 Royal Bank Tower 1101 - 101st Street  
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**From:** James Hnatowich <[james.hnatowich@pinter.ca](mailto:james.hnatowich@pinter.ca)>

**Sent:** Thursday, October 13, 2022 5:07 PM

**To:** Jessica Phelps <[Jessica.Phelps@wsask.ca](mailto:Jessica.Phelps@wsask.ca)>

**Cc:** Dustin Hicke <[dustin.hicke@pinter.ca](mailto:dustin.hicke@pinter.ca)>; Ibrahim El-Baroudy <[ibrahim.elbaroudy@pinter.ca](mailto:ibrahim.elbaroudy@pinter.ca)>

**Subject:** 2880 Floral Drainage Design

**CAUTION:** External to WSA. Verify sender and exercise caution opening links and attachments.

Good afternoon Jessica,

We are working on a subdivision for a property in the RM of Corman Park. We are getting very close to completing all phases of the development review. Adam Toth, the senior planner at the RM requested that I send you a copy of the technical memo regarding drainage for this project. I have attached that memo below.

Once we get the drainage signed off we can really expedite this project, we are currently held up by this, so we would really appreciate your review.

Thanks for the help, and have a nice day!

Regards,

James

--

**James Hnatowich**

B.Sc.E. Engineer-In-Training. B.A. Planner-In-Training



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**James Hnatowich**

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